TEXAS PERFORMANCE-BASED FUNDING: EXAMINATION OF RELATIONSHIPS BETWEEN SUCCESS POINTS AND VARIABLES AT COMMUNITY COLLEGES

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by

Matthew L. Olmstead

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DEDICATION

There are a few people very close to my life that I would like to dedicate my dissertation to. To my wife Joelle. Thank you for all your support throughout the years. Without your support and willingness to be there when I could not during this process, I would not have been able to finish. To my children, Austyn and Camdyn. I pray that when you read this, this can be a reminder of what can be accomplished with prayer, motivation, and family support. Never give up on your dreams, or, let someone else decide your dreams for you. Walk with God and let Him guide your path, always.

I also want to dedicate my dissertation to my parents, Denell and Keith. As a first-generation college student, my parents encouraged me and supported me to receive the higher education possible. To my mom who continually supported me through my journey over the past few years, and to my dad, although in Heaven, is watching with joy and celebration. Thank you both for my childhood and support.

Lastly, I dedicate this dissertation to my Faith in Jesus. Without my relationship with Christ through this process, I am confident I would not have completed. I do not have the capacity or ability to complete something of this magnitude on my own.

ABSTRACT

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A portion of state-allocated funding for Texas community colleges has been reserved for the completion of outcome metrics, also known as performance-based funding. Texas community college leaders are faced with the challenges of adapting to increasing pressures from performance-based funding, while also ensuing institutional missions and goals are met. The problem addressed in this study was the perceived imbalances, inequities, or consequences between state-implemented performance measures, student demographics, and success points generated at Texas community colleges. There were several purposes to this study that examined the relationships between performance-based funding outcome measures and the generation of student success points.

The participants in this study were all Texas community colleges or community college systems that received performance-based funding and reported student success points for the 2017-2019 academic years. Results from this study indicated several outcome measures were statistically significant to the generation of student success points. Multiple regression analysis revealed that the combination of specific independent variables, including ethnic and non-ethnic group variables statistically significantly contributed to the generation of success points. Several key findings, implications, and recommendations were addressed in this study and were categorized into the key areas: (a) correlation between independent variables; (b) student demographics treated independently; (c) all student demographics combined; (d) certificate or degree

completion as a major contributor to student success point variance; and (e) time to certificate or degree completion.

Major recommendations were addressed for state lawmakers, community college leaders, and researchers. Among these recommendations were the importance of state lawmakers to work directly with key community college leadership and for researchers of performance-based funding to help with the review and creation of ongoing successful performance-based funding measures. Community college leaders should be educated through the review of performance-based funding literature and understand the importance of hiring key officials that understand performance-based funding. Finally, state lawmakers should be aware of unintended consequences for community colleges with performance-based funding. Community college leaders should not be penalized by performance-based funding measures, either directly or indirectly, for admitting certain ethnic groups and serving the needs of their communities.

KEY WORDS: Performance-based funding; Performance-based funding 1.0; Performance-based funding 2.0; Success points; Community colleges; Texas community colleges; Universities; Base-plus funding; Enrollment-based funding; Policy diffusion

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First and foremost, I would like to thank the Lord of my life, Jesus Christ. I am certain, without a doubt, that my personal abilities are limited and this achievement would have not been possible without His guidance, strength, and wisdom. James 1:2-3 states *Consider it pure joy my brothers when you face trials of many kinds, because you know that the testing of your faith develops perseverance.* I have experienced multiple trials during this journey and I thank God for the perseverance he has instilled in me.

Thank you to my wife, Joelle. You have supported me throughout this journey and have been understanding through my work during this process, including long nights studying and my absence over the last few years. You have sacrificed so I could finish. Thank you to my two children, Austyn and Camdyn. I know you will go on to achieve greatness in your own right. I hope my journey inspires you to work hard and go places.

Thank you to my mother Denell and my father Keith. You both have supported me through the years of childhood and have always encouraged me to do my best. The sacrifices you made with me as a child has helped me get to this point. Although my father passed away several years ago after watching me receive my Masters, I know he will be celebrating in Heaven watching me receive my doctorate.

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There have been many newly established relationships, friendships, and activities that have kept me going over the past few years. In the midst of writing my dissertation, I have also gained long-lasting friendships. I have even been able to reevaluate the important things in life and have been able to take on a few hobbies. There are so many

thanks to give to family and friends that have been supportive throughout this process. There have been times I have wanted to give up, but my relationship with Christ, my friends, my ability to focus on the important things in life, and my ability to reevaluate the direction of my life deserves special acknowledgement.

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CHAPTER I

Introduction

In 2000, Texas legislators adopted and implemented *Closing the Gaps* (Texas Higher Education Coordinating Board [THECB], 2016), a 15-year strategic plan for all Texas institutions of higher education spanning from 2000-2015 (THECB, 2016). The initiative was intended to increase success rates in four major areas: (a) excellence, (b) participation, (c) research, and (d) success (Tajalli & Ortiz, 2018; THECB, 2016). One major milestone of the plan was to enroll 630,000 additional students by the 2015 fall semester than in the 2000 fall semester (THECB, 2016). The plan also consisted of a component to increase enrollment and graduation rates targeted for Hispanic students (Tajalli & Ortiz, 2018). Although the enrollment of Hispanic students increased by 137%, this enrollment increase did not meet enrollment targets for Hispanic student enrollment targets initially set by the plan creators (THECB, 2016). A strength of the program was its simplicity, with measures that were clearly defined, which could be easily tracked through the 15-year implementation period (Holcombe, 2015). Moreover, this plan helped with the allocation of funds and the identification of success or challenges associated with the four measurable areas (Tajalli & Ortiz, 2018).

After the conclusion of the 15-year *Closing the Gaps* initiative, the target enrollment of 630,000 more students fell short by approximately 25,000 students (THECB, 2016). Additionally, the goal of increasing and improving Black student enrollment was the only ethnic group goal that was achieved in the 15-year span of *Closing the Gaps*. However, several goals were accomplished, including: (a) the awarding of 210,000 degrees or certificates just one year after implementation; (b)

certificate or degree completion by Hispanic students increased fourfold; (c) certificate or degree completion by Black students increased threefold; and (d) several programs were highly ranked in excellence, at all levels of higher education (THECB, 2016).

After the *Closing the Gaps* initiative concluded, the *60x30TX* plan was developed and consisted of the primary goal of ensuring that at least 60% of all residents of Texas aged 25 – 34 years old would earn either certificate or degree by 2030 (THECB, n.d.). Sought in the *60x30TX* plan was the increase of student success through the collaboration and expertise of various stakeholders (THECB, n.d.). Secondary goals of the plan included: (a) 550,000 students to complete some type of certificate or degree from a Texas college or university; (b) all graduates from public Texas colleges or universities will have skills that have been identified as marketable; and (c) ensuring that student loan debt for undergraduate students do not exceed 60% of the wages for graduates in their first year after graduation (THECB, n.d.). Moreover, prior to the implementation of *60x30TX* in 2013, Texas policymakers revised the state's higher education funding structure to set aside a portion of community college state appropriated funding to be based on the achievement of student outcomes, as outlined by the state legislators (McKinney & Hagedorn, 2015, March 24; McKinney & Hagedorn, 2017; Li et al., 2018).

The inclusion of student success points was added to the existing state appropriating model of core operations and funding for contact hours generation in 2013 (Texas Association of Community Colleges [TACC], 2013). In 2013 each Texas community college was funded at approximately $185.00 per success point (TACC, 2018). Student success point funding increased from $171.56 per success point generated for the 2018-2019 biennium to $214.76 per success point generated for the 2020-2021

biennium (THECB, 2019). Moreover, during the 86th Legislature session, THECB officials recommended changes in student success points weights to be implemented during the 2022-2023 biennium which include: (a) changing success points received for each student who transfers to a university from 2.0 points to 2.75 points; (b) lowering the number of success points received for each student who completes a certificate or degree from a field that is not critical (e.g., STEM) from 2.0 points to 1.2 points; and (c) raising the number of success points received for each student who completes a certificate or degree in a critical field from 2.25 points to 3.0 points (THECB, 2019). Funding of student success points are calculated based on a 3-year average to account for any fluctuations that may occur during this period (TACC, 2018). In 2018, funding for student success points represented 10.60% of the total state appropriation for Texas community colleges.

According to the TACC (2013), the notion of the performance funding model is that community college success should not solely be defined based on the number of degrees that are awarded or the number of students that transfer to 4-year institutions. Although, according to the weighted success point scales as outlined by the THECB (2017a), students currently earn more success points by earning a certificate or degree, or transferring to a senior institution, than in any other measurable field. This, in turn, may incentivize many institutional leaders to prioritize the completion of degrees or certificates and the transfer to four-year institutions as primary institutional goals. Included in this performance-based funding model are other intermediate measures that encourage successes in developmental education and completion of first-year mathematics courses (TACC, 2013).

Despite the implementation of several performance accountability programs such as *Closing The Gaps* and *60x30TX*, as outlined by the THECB (n.d.), state-wide funding for both 2-year and 4-year colleges in Texas decreased by $6.6 billion from 2008 to 2016, after adjusting for inflation (Mitchell et al., 2019). Despite these statistics, Texas community colleges were the largest higher education sector in Texas, admitting over 46% of the student population in higher education (TACC, 2019).

Statement of Problem

Since the 2011–2014 academic years, student success points awarded by the achievement of outcomes at Texas community colleges have increased by 14%; however, these gains in success points have not been proportionally accompanied with increases in the amount of funding per success point generated (TACC, 2019). Performance-based funding was implemented as a budgeting measure with the strongest level of accountability, connecting outcomes directly with accountability (Kelchen & Stedrak, 2016). The National Conference of State Legislators [NCSL] (2015) claimed that these outcomes included indicators and measures tied to institutional successes such as degree completion rates and institutions' ability to recruit low-income and minority students. However, community college research comparing the effects of performance-based funding and institutional measures is lacking compared to universities (Li, et al., 2018). As community college performance-based funding measures increase, the performance-based funding model “becomes a driver for survival” (McKinney & Hagedorn, 2017, p. 21). As outlined by McKinney and Hagedorn (2017), Texas community college administrators and leaders may feel pressured to create policies to attract certain groups of students (e.g., top performers).

In a study of a large Texas community college system that was conducted to encourage lawmakers to provide support for admitting disadvantaged students, McKinney and Hagedorn (2017) discovered that Black men and holders of GEDs were less likely to bring in performance-based funding for their respective institution, and Asian students, full-time students, and students who received Pell Grant funding accounted for more performance-based funding than any other student groups. Moreover, Texas institutions could be penalized for recruiting at-risk-students since current Texas Higher Education Coordinating Board funding metrics do not reward colleges directly for recruiting at-risk students (McKinney & Hagedorn, 2017). Additionally, D'Amico et al. (2014) evaluated the developments related to performance-based funding, and the researchers evaluated how community college administrators address performance indicators. Moreover D'Amico et al. (2014) researched the most common indicators that have consistency with previously identified key indicators associated with community colleges and reported degree completion, student retention, transfer rates, and graduation rates were key state indicators.

Moreover, it is critical for both university administrators and lawmakers to understand the relationships and correlations between performance-based funding measures and institutional outcomes to the admission of at-risk students (Hanes, 2017). College administrators should understand how their institutions are funded in this section of the plan. Lawmakers have decisions to make about whether or not to amend the plan. Lawmakers and researchers want to know if this model is working. McKinney and Hagedorn (2017) recommended understanding the consequences that may exist with performance-funding models. Therefore, the problem being addressed in the present

study is perceived imbalances, inequities, or consequences between state-implemented performance measures and student demographics and success points generated at Texas community colleges.

Purpose of Study

There were four purposes to this study. The first purpose of this study was to whether there was a statistically significant relationship present between the combination of students enrolled by demographic (i.e., Asian, Black, Hispanic, International, White, and students of other ethnicities) in Texas community colleges in the 2017-2019 academic years. The second purpose of this study was to determine whether there was a statistically significant relationship between students, by demographic, (i.e., Asian, Black, Hispanic, White, and combined) and the number of success points generated at Texas community colleges in Texas community colleges in the 2017-2019 academic years. The third purpose of this study was to determine whether there was a statistically significant relationship between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years. The fourth purpose of this study was to determine whether there was a statistically significant correlation between the student time to completion (i.e., years to receive certificate or degree) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years. The purpose of this study correlated with existing outcome funding measures for Texas community colleges, or, are variables that may have some impact on the effects of performance-based funding.

Educational Significance of Study

Prior to 2013, Texas was funded primarily based on enrollment [i.e., the number of generated student contact hours] (Hanes, 2017; Natale & Jones, 2018; Okerblom, 2019). However, in 2013, Texas legislators passed a funding policy that set aside 10% of funding that would have normally been allocated for enrollment to be awarded through performance-based funding (Ellis, 2015; Hanes 2017; McKinney & Hagedorn, 2017; Natale & Jones, 2018; NCSL, 2015). Since the implementation of performance-based funding, little research has been conducted to evaluate any statistically significant correlations between institutional characteristics and student success point generation (Hanes, 2017). Community colleges are awarded student success points by achieving specific state-implemented outcomes, or milestones, in the areas of students becoming college ready, completion of semester credit hours, earning a certificate or degree in a non-critical and critical field, and successfully transferring to a senior institution (THECB, 2017a). It is important for community college administrators to understand how the structure of performance-based funding through the dissemination of student success points based on student outcome measures have impacts on college funding and the generation of student success points (Hanes 2017; Natale & Jones, 2018).

The performance-based funding structure, combined with increased initiatives by Texas community colleges to adapt to this new funding structure in order to meet resource demands, should be predictive of statistically significant positive differences between student success points between academic years. However, increases or decreases in student success points in relation to college readiness may also be dependent upon external factors, such as the influx of students entering college not ready in these

subjects, colleges' ability to fund initiatives to improve college readiness which will increase success point generation, and colleges' perception of the impact college readiness has on overall performance funding (i.e., the effort required to improve college readiness in relation to funding appropriation). This study's findings may be used to help inform lawmakers of the level of success of already implemented funding strategies, which may serve as a research tool in revising current policy and implementing future policy. College administrators may better understand the overall effectiveness of their college's accumulation of success points and funding based on the findings of this study.

The inclusion of student demographics and ethnic variables in this study, which are not directly tied to the dissemination of performance funding, may educate lawmakers for the need to continually research data associated with performance funding when making decisions. These decisions may include the addition or elimination of current funding variables, and the changes in funding amount per student success point. Dowd et al. (2020) emphasized the importance for college and university officials to obtain and create accurate and legitimate data. I presented findings that may be examined to help inform community college officials of the impact of performance-based funding on the generation of student success points. According to Dowd et. al. (2020), these data can be used to make needed improvements and better understand the performance of the institution regarding performance of outcomes. Findings from this study are available for university officials from various sectors to observe empirical data to determine, what not only contributes to student success, but also what contributes to funding. Lastly, I provided data that may necessitate ongoing relationships between Texas community college decision makers and state policymakers.

Research Questions

The following research questions were addressed in this study: (a) What, if any, statistically significant relationship was present between the combination of students enrolled by demographic (i.e., Asian, Black, Hispanic, International, White, and students of other ethnicities), in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (b) What, if any, statistically significant relationship was present between the number of Asian students, Black students, Hispanic students, International Students, White students, and students of other ethnicities enrolled in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (c) What, if any, statistically significant relationship was present between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; and (d) What, if any, statistically significant relationship was present between student time to completion (i.e., years to receive certificate or degree) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?

Theoretical Framework

The principal-agent theory was employed as a theoretical framework for examining these research questions. According to Tandberg and Hillman (2014), the concept of the principal-agent theory consists of both a principal (i.e., an entity that sanctions or rewards the agents) and agent (i.e., those who meet the goals or objectives

set forth by the principal). In the case of this research study, I have identified the principals as the state agencies that implement funding measures (e.g., states' coordinating boards) and the agents are identified as the leaders and faculty at institutions of higher education (i.e., 2-year colleges or 4-year colleges). Additionally, I have identified a higher-level principal-agent relationship between intermediary organizations, or, agenda-setting organizations (i.e., the principal) and state-reporting agencies (i.e., the agent). This relationship between agenda-setting organizations and state reporting agencies are discussed further in the literature review, in their role with policy diffusion. I also evaluated the complexity of the shifting principal-agent relationship, where the principal can become the agent if faced with external pressures and consequences from various nonprofit and philanthropic agencies that can impact higher education funding.

According to Tandberg and Hillman (2014), the relationships between the principals and agents can be complicated when the principal and agent do not agree on goals or objectives and when there are financial incentives in place. As outlined in this research study, various state legislators have implemented various methods of performance-based funding for their state colleges and universities. The failure, or inability, to achieve these outcome measures can further threaten principal-agent relationships and have an impact on the rewards or consequences associated with the relationship.

As demonstrated in subsequent sections, the principal-agent theory guided many aspects of this study, including the development of research questions, the review of relevant literature, methods chosen, analyses conducted, and interpretation of findings for discussion. I used existing literature to examine the challenges and opportunities

available for different types of colleges (e.g., community colleges, universities, and Historically Black Colleges and Universities [HBCUs]). I also sought to examine the role that these intermediaries have with the implementation of performance-based funding, through the research of policy diffusion and influence that these agenda-setting organizations can have on state agencies through rewards, coercion, or the ability to financially contribute to state agencies, as outlined by Gándara et al. (2017) and Miller and Morphew (2017).

Definition of Terms

In this research study, several sources were used to define terms relevant to the research. Accordingly, in addition to relevant sources in the field of higher education finance and performance-based funding, definitions found from Texas state reporting agencies were used. This method was deliberate to ensure that terminology used in this research study was consistent with prior and existing research and to ensure terminology was consistent with how the state reporting agency identified specific terms, which are used for reporting and accountability purposes.

Performance-based funding is a budgeting formula model where policymakers have dedicated a portion, or all, of a college or university's state-allocated funding based on the achievement of outcome measures (NCLS, 2015).

Performance-based funding 1.0 is a type of performance-based funding model where state policymakers allocated a bonus that is distributed to colleges and universities that is above any normal state appropriation based on the achievement of outcome measures or certain indicators (Association for the Study of Higher Education [ASHE], 2013a; Dougherty & Reddy, 2013; Hearn, 2015; Li & Kennedy, 2018).

Performance-based funding 2.0 is a performance-based funding model where state policymakers incorporate outcome measures as a part of any original state appropriation, rather than a bonus, as described in performance-based funding 1.0 (ASHE, 2013a; Dougherty et al., 2013; Dougherty & Reddy, 2013; Hearn, 2015; Li, 2017).

Success Points are attainments that are measurable and correlate with the completion of specific outcome milestones (THECB, 2017).

Community Colleges (2-year public institutions) are postsecondary institutions that offers at least 2-year programs but less than 4-year programs, including occupational and vocational programs with no less than 1,800 hours and academic programs not exceeding 4 years (National Center for Education Statistics [NCES], n.d.).

Texas Community Colleges are public 2-year institutions that serve their local taxing districts and offer services, associate degrees, or certificates in various workforce and academic fields (THECB, 2017b).

Universities (i.e., 4-year institutions) are postsecondary institutions with existing programs that are at least 4 years in duration or offices programs that are at, or exceed, the level of baccalaureate (NCES, n.d.).

Base-plus funding is a budgeting model where state policymakers use the prior-year's budget as a baseline to create the next year or biennium budget (Hearn, 2015).

Enrollment-based budgeting is a funding approach where state policymakers award colleges funding based on enrollment and the generation of contact or credit hours (Hearn, 2015).

Policy Diffusion is defined as when state policymakers adopt policies in their own state due to the observation of state policies implemented in surrounding states (Dougherty et al., 2013; Li, 2017).

Delimitations

According to Simon and Goes (2013) delimitations represent the boundaries of a research study that arise from the choices made by the researcher. These choices, according to Simon and Goes (2013), begin with the researcher selecting a problem, which could be delineated from other possible problem selections; meaning that other potential problems were excluded from the study for research purposes. Additionally, identification of a research problem is one of the first steps to developing a case study (Creswell, 2013). The problem identified in this research study were the perceived imbalances, inequities, or consequences between student demographics and institutional characteristics compared with the generation of student success points at Texas community colleges between the 2017-2019 academic years. Today, over 30 states use some form of performance measure as part of their funding formula (Hillman, 2016: Kelderman, 2019; NCLS, 2015). To narrow the focus of this study, I excluded the possibility of a nation-wide study of performance-based funding based on the ongoing changes and trends to state-wide policies and legislative budget structures. States such as New Mexico and Mississippi use performance-based funding strategies broadly with funding appropriations, whereas other state policymakers only dedicate a portion of the state's overall funding as a result of performance (NCLS, 2015). Dougherty and Hong (2006) claimed most data does not account or control for differences between or across states. Due to the variability of how performance-based funding is allocated and

measured across various states, I decided to perform a single state-wide multivariate analysis, involving the State of Texas, while excluding surrounding states from the analysis.

Academic years 2017-2019 were used in this research investigation because success points are disseminated based on a three-year period average in the State of Texas. Moreover, the 2017-2019 academic years also represented the latest reported data available through the state's reporting system. Previous studies on student success points in Texas community colleges (Hanes, 2017; McKinney & Hagedorn, 2017) have utilized prior data reported by the state's reporting system and do not represent the most current data available. Using the most recent data available will help researchers build upon already existing data of previous years and will be important for community colleges as officials will be able to recognize performance and funding trends that were not previously identified.

Moreover, 4-year universities were omitted from the analysis. At the time of this study, Texas performance-based funding, implemented since 2013, only applied towards Texas community colleges (THECB, 2017a). I decided to exclude four-year universities from the study in order to evaluate data based on current and past effects of performance-based funding and student success point generation. Success points were only applicable to Texas community colleges. Because a potential impact of this study was to inform policymakers of the overall effects of performance-based funding in relation to success point generation, I included all 50 Texas community colleges, or systems.

Student success points were awarded based on a 3-year average and the latest data available in the state's reporting system was used; the 2017-2019 academic year data,

which was used in determining funding for the 2020-2022 biennium. These data are the most recent 3-year cycle data available at the time of completion of this study.

Additionally, I included student race demographic variables that were not a direct performance measure in order to examine what relationships between enrollment by demographic and success point generation were present based on a student's ethnic group and performance funding received from the state. This variable selection was selected partially as a result of McKinney and Hagedorn's (2017) finding that community colleges may be disadvantaged for admitting disadvantaged students.

According to the THECB (n.d.), the *60x30TX plan* adopted by state legislators is a goal that 60% of all Texan between the ages of 25 and 34 will have some sort of certificate or degree by 2030. Texas community colleges are not only under pressure to matriculate or transfer students with certificates or degrees, but they are also faced with the challenges of matriculating students in a timely manner. The time to completion variable was added to the study, despite not being a direct outcome implemented by the state, to understand any statistically significant relationships between the time it takes a student to complete their certificate or degree and student success point completion. This may better help college administrators understand the potential correlation or relationship between student time to completion and the performance funding. Student race and student time-to-completion were also included in this study as being separate from existing performance measures.

One success point is allocated for each student who becomes mathematics ready, compared to only .50 success points for students who become college ready in reading or writing (THECB, 2017a). Due to the additional weight placed on completion of

developmental mathematics and becoming college ready in mathematics, reading, and writing completion rates were omitted from this study. Moreover, I did not include the measure of developmental course completion due to the inclusion of variables related to becoming college ready. I intentionally included some variables that were state implemented (e.g., completion of certificate or degree) and some variables that community colleges are not directly awarded success points based on outcome measure completion (e.g., admission of certain student groups and time to completion). This selection method was used to provide data to administrators and lawmakers that some variables may be excluded that need to be evaluated in performance funding strategic planning. Additionally, with the addition of new performance goals, such as *60x30TX*, policymakers must routinely evaluate funding strategies to match with student outcome goals, as there may be competing measures between student outcomes and state funding.

Limitations

Simon and Goes (2013) noted that limitations are elements of the dissertation or research study that are outside of the researcher's control. Although several measures were implemented in this study to address delimitations, as previously mentioned, I identified multiple limitations of the study that need to be addressed.

Success point data used in this study were a snapshot of the average of 3 years of success points. For this study, funding for the 2020-2021 biennium were dependent upon success points earned from the 2017-2019 academic years. Although these data adequately represent funding as implemented by the state, it may not accurately represent current student enrollment that will impact future biennium funding. Texas performance-based funding has traditionally been calculated by using previous biennium enrollment

and performance outcomes. Although this limitation existed, this method of data collection was necessary in order to match the state's method for awarding success points. This snapshot does not factor in external conditions that may have an impact on variable outcomes (e.g., economic conditions, natural disasters, etc.). Although I included all 50 community colleges in the state as part of the analysis to obtain data maturation, many community colleges are diverse in their student makeup and demographics. The TACC (n.d.) outlined Texas community colleges by region: (a) central, (b) east, (c) north, (d) south, (e) southeast, and (f) west. Within these regions, as outlined in TACC (n.d.) student characteristics, graduations rates, graduate success, and completion measures may be different between colleges and regions. Because of this, statewide aggregated data may not fully represent individual colleges, as student demographics vary between community colleges and the regions these community colleges are located. To better understand correlations of performance-based funding and outcome measures for individual community colleges, additional research may be necessary to understand these relationships.

Assumptions

Simon and Goes (2013) described research assumptions as a necessary element included in research, to be able to conduct a study. These assumptions, according to Simon and Goes (2013) are elements of the study that are believed to be true without the need for validity verification. In this research investigation, one assumption was the validity of the data from the state's reporting system. It would not be plausible, nor possible, to verify all data that was provided by the state's reporting system. Therefore, I

held the belief that any data extracted from any official state reporting site for the collection of data for this study was valid.

Another assumption in this study was that the incorporation of funding based on performance of outcomes will continue to be an integral and major part of Texas community college funding. As previously mentioned, student success points have been incorporated as part of community college funding since 2013 (McKinney & Hagedorn, 2015, March 24; McKinney & Hagedorn, 2017; Li et al., 2018; TACC, 2018). This research study was developed with the belief that this trend of increased accountability based on the performance of outcome will continue to grow in the coming years.

Assumptions were also made in the compilation and review of research for this study. Several research studies, both quantitative studies and qualitative studies were reviewed for this investigation. Prior research and results from these research studies were examined to better understand performance-based funding and the results and implications of this funding strategy. For example, McKinney and Hagedorn's (2017) investigation that cautioned that community colleges may be disadvantaged in admitting at-risk students was a major driver of incorporating ethnic demographic variables to this study. As a result, the outcomes of these studies, both quantitative and qualitative were assumed to be accurate.

Organization of Chapters

This dissertation is divided into five chapters. Chapter I consists of the following sections: (a) introduction and background of the study; (b), statement of problem; (c) purpose of study; (d) educational significance of study; (e) research questions; (f)

theoretical framework; (g) definition of key terms; (h) delimitation; (i) limitations; (j) assumptions; (k) organization of the chapters; and (l) summary.

Chapter II consists of a comprehensive review of literature, where I have examined past and recent literature in the field of performance-based funding. Provided in the review of the literature are various subsections related to existing research on performance-based funding. These sections include: (a) introduction of the literature review; (b) explanation and history of performance-based funding; (c) trends in higher education funding, including base-plus funding, enrollment-based budgeting and early performance-based funding, performance-based funding 1.0, and performance based-funding 2.0; (c) state action (i.e., different state implementation measures related to performance-based funding); (d) impact of performance-based funding for Ohio and Tennessee; (e) institutional administrative reaction to performance-based funding; (f) policy diffusion; (g) policy implementation and unintended consequences of performance-based funding; and (h) summary of literature review.

Provided in Chapter III is the methodology of the research investigation and include the following sections: (a) introduction (b) purpose (c) research questions, (d) research design, (e) selection of participants, (f) instrumentation and procedures; (g) data analysis; and (h) summary. Provided in the selection of participants include participants, study population, sample, and sampling method and selection criteria.

Included in Chapter IV is an in-depth analysis outlining any statistically significant relationships between the independent and dependent variables in this study, as outlined in the research questions. Additionally, provided in this section are detailed descriptive statistics related to the purpose of this analysis. Located in Chapter V are

detailed discussion of results, including interpretation of results, implications of results, and recommendations for state lawmakers, community college leaders, and researchers.

Summary

As discussed in Chapter I of this research study, Texas policymakers have adopted many outcome and funding strategies over the past several decades that has impacted how leadership respond to funding the performance of student outcomes. Some of these strategies have included *CTG, 60x30TX,* and performance-based funding. Performance-based funding, adopted by Texas lawmakers in 2013 (Li, et al., 2017; McKinney & Hagedorn, 2017; TACC, 2018) to allocate a portion of existing state appropriations to the completion of outcomes, has shifted the way community colleges are funded. However, as identified by McKinney and Hagedorn (2017), these changes in funding may also create consequences, either intended or unintended, for leaders of community colleges.

In this research study, the problem of perceived imbalances, inequities, or consequences between the generation of student success points and the completion of outcome measures were investigated. Four research questions investigated the presence of any statistically significant relationships between the generation of success points and the completion of outcome measures are analyzed. The organization of this research study was carefully considered through a process of understanding delimitations, limitations, and assumptions of this study. Provided in Chapter II was a comprehensive review of literature on the topic of performance-based funding, including a synthesizing of literature from several researchers that have already completed research on performance funding.

CHAPTER II

Literature Review

Introduction

This literature review was written to provide a comprehensive examination of current research in the field of performance-based funding in higher education at both a state and national level. National data on performance-based funding were provided in this literature review, which included descriptions of early funding models in the years leading to performance-based funding strategies. I sought to draw upon existing research in the field of performance-based funding from various researcher viewpoints. This was necessary to ensure data maturation and to eliminate any unintended biases of performance-based funding.

Although the analysis of this study was narrowed to examine the effects of Texas community college performance-based funding on the achievement of outcome measures, this literature review was organized in a method that provided a broad overview of national level and state level performance-based funding. The organizational strategy of this review of literature was developed to provide a better understanding of the different methods and funding models associated with performance-based funding, as well as a method to understand how performance-based funding policies may spread from one state to another state (i.e., policy diffusion). As presented previously, the problem of the perceived imbalances, inequities, or consequences between state-implemented performance measures and student demographics and performance-based funding were examined through this literature review.

As such, this literature was organized in eight major sections: (a) explanation and history of performance-based funding; (b) trends of higher education funding; (c) national makeup of performance-based funding; (d) state action and impact of performance-based funding; (e) impact of performance-based funding for Ohio and Tennessee; (f) institutional administrative reaction to performance-based funding; (g) policy diffusion; and (h) policy implementation and unintended consequences of performance-based funding. The main purpose of the organization of these sections was to better evaluate the evolution of performance-based funding from its inception in 1979 and to examine literature regarding the perceived inefficiencies, inequities, and consequences of performance-based funding.

Explanation and History of Performance-Based Funding

When state policymakers implement a portion, or all, of the states' colleges' or universities' state-appropriating funding as a result the achievement of institutional outcomes measures, this funding strategy is known as performance-based funding (Burke & Moderesi, 2001; Dowd et al, 2020; Kelchen, 2018; Li & Kennedy, 2017; McKinney & Hagedorn, 2017; NCLS, 2015; Rosinger et al., 2020; TACC, 2013). Implementation of performance-based funding measures have been a method used by state policymakers to hold college and university leaders accountable for student performance and the achievement of institutional performance metrics (Gándara, 2019; Kelchen, 2018; Rosinger et al., 2020). These performance-based funding budget models were implemented after many state policymakers believed that colleges and universities were falling behind in terms on degree completion and other student and institutional outcomes (Hillman et al., 2015). Performance-funding strategies have been viewed by state

policymakers as an approach to focus on outputs, rather than inputs and to keep outcome performance aligned with broader state policies (Hillman et al., 2015). This shift to outcome performance measurements from input performance measurements allowed state policymakers to stimulate the behavior of institutional leaders to become more productive and efficient with their budgets related to student outcomes (Rutherford & Robovsky, 2014). Prior to the implementation of performance-based funding, institutional leaders had little reason to focus on outcomes, as much of institutional leaders' attention was centered around success in areas such as graduate programs and research production (Rutherford and Robovsky, 2014).

During the early stages of performance-based funding, simple, more traditional models, were created by state policymakers to reward institutional leaders who met institutional outcomes and punish institutional leaders who did not meet the implemented outcomes (Cavanaugh & Garland, 2012, June 6). These early performance-based funding strategies often failed because state policymakers did not assign weighted risk to the funding with the completion of outcomes and because many state policymakers discontinued performance-based funding models during periods of economic downturn (Cavanaugh & Garland, 2012, June 6). Moreover, state policymakers who sustained performance-based funding measures during difficult economic times sent messages to institutional leaders of the importance and priority of these performance outcomes, despite any economic conditions or hardships institutions may have experienced (Cavanaugh & Garland, 2012, June 6). Some state policymakers have revised funding models to include measures associated with STEM degree production and the completion of STEM outcomes and degrees are often viewed as an important component of

economic growth in individual states (Rosinger et al., 2020). As described later in the state action section of this literature review, Texas policymakers have assigned the highest weight of any outcome measures to the awarding of STEM degrees than any other outcome measure and have assigned separate weight to the completion of STEM degrees (THECB, 2017a).

This level of accountability associated with performance-based funding is the single strongest accountability measure placed on colleges and universities to help ensure student success and student outcomes (Kelchen & Stedrak, 2016). Moreover, performance-based funding models have been created to improve several student outcomes, which include outcomes in areas such as completion of developmental education, persistence rates, transfer rates, and job placement (Dougherty et al., 2016).

Moreover, the implementation of performance-based funding measures have allowed the opportunity for college and university officials to work collaboratively with state agency officials to achieve larger and broader goals, while simultaneously meeting set performance goals and outcomes (NCLS, 2015). Structurally, performance-funding models help initiate organizational change within the institution (Thornton & Friedel, 2015). These performance-based funding models are new ideas (Li & Kennedy, 2017), meaning that institutions are newly affected by this funding strategy. Institutions will respond to these newly adopted policies in the same year of implementation, even though the effects or award for the completion of these outcomes may not be apparent until the following year or thereafter (Li & Kennedy, 2017).

However, despite many positive outlooks of performance-based funding by support from organizations such as the NCSL, Complete College America, and the

Lumina Foundation (Miller & Morphew, 2017), the reasoning behind the implementation of many performance-based funding strategies are reactive, initiated from a perception that many colleges and universities lack efficiency in their current practices (Kelchen, 2018). Moreover, performance-based funding models are often ineffective in improving completion rates and are the "zombies of higher education" and no amount of evidence about the inefficiencies of performance-based funding have been able to kill the initiative (Gándara, 2020, January 12). Higher education organizations are complex in ensuring student success and many stakeholders are not aware of performance-based funding, or are these stakeholders involved in the process of implementation (Gándara, 2020, January 12). Moreover, some college and university leaders do not agree with the performance-based funding initiatives and may circumvent policy by manipulating internal data (Gándara, 2020, January 12) and in some cases lower academic standards (Dougherty et al., 2013, Li, 2017).

Further, a standard state performance-funding model assumes consistency in all the state's colleges' missions and strategic decisions made at each campus (Cavanaugh & Garland, 2012, June 6). If this assumption of consistent missions and strategic decisions across colleges were not true, comparing outcomes between colleges and universities becomes more difficult and less indicative of an individual institution's actual progress (Cavanaugh & Garland, 2012, June 6). A best practice in implementing performance-based funding measures is to ensure that models are differentiated between institution category (Li, 2017). Because 2-year colleges may have specific missions related to transfer rates, these colleges should be rewarded for students who transfers in addition to degree completion (Li, 2017).

As explained hereafter in this literature review, there are unintended consequences for community college leaders from the implementation of performance-based funding (Dowd et al., 2020; Gándara, 2020, January 12; McKinney & Hagedorn, 2017). Performance-funded measures have been less effective than what has been hoped for by state policymakers and 2-year colleges specifically lack the necessary resources to meet the goals of performance-based funding outcomes (Mitchell et al., 2019). Although the intended purpose of performance-based funding was to increase graduation rates and student retention rates (Dougherty et al., 2016; TAAC, 2019), conflicting research that outlines the inadequacies or success of the funding measure requires further research. As such, performance-based funding models should be flexible to account for institutional differences (Cavanaugh & Garland, 2012, June 6). Moreover, accountability measures placed on community colleges to achieve these performance-based funding measures are important to further discuss and research (Hanes, 2017).

Trends of Higher Education Funding

Most state policymakers rely on funding from tuition and fees, as opposed to state or local appropriations, to fund public colleges and universities (State Higher Education Executive Officer's Association [SHEEO], 2018). After adjustments for inflation, state funding per student full-time equivalent in 2018 was lower than funding per student full-time equivalent at the height of the Great Recession of 2008 (SHEEO, 2018). During difficult economic times, funding for higher education has traditionally been reduced to help *balance the wheel* (Delaney & Doyle, 2011). Balancing the wheel is an attempt by state policymakers to balance the state's overall budget, often by using colleges and

universities as one of the first categories to reduce because of the availability of various revenue opportunities for these institutions (Delaney & Doyle, 2011).

Only nine states' colleges and universities have returned to funding levels from pre-recession and 11 states have not exceeded the lowest funding points that were obtained during the Great Recession (SHEEO, 2018). Moreover, state appropriations were lower in 2018 than in 2017 for 22 states (SHEEO, 2018). Despite reduced state appropriations in economic downturns, higher education student enrollments have typically increased during these times due to the countercyclical nature of higher education (McKeown-Moak, 2013). This countercyclical nature of higher educational has made it challenging for colleges and university officials to address the pressures at the state and national level (McKeown-Moak (2013). Pressure from the national level and advocate organizations to implement performance-based funding measures in order to improve completion rates has shifted the focus of fiscal allocation from institutional needs to measurable student success (McKeown-Moak, 2013).

To better explain the evolution of funding in higher education and the funding strategies leading to performance-based funding, outlined in this portion of the literature review are the stages, or phases, of higher education funding, as described by the Hearn (2015). Prior to the year 2000, three major funding strategies existed: (a) base-plus funding (i.e., incremental budgeting); (b) funding based on enrollment; and (c) early versions of performance-based funding (Hearn, 2015). Although Hearn (2015) separated enrollment-based funding from performance-based funding, funding based on enrollment was a form of performance funding associated with the achievement of inputs, rather than

outputs (Nisar, 2015). Funding based on outputs are indicative of later performance-based funding strategies.

The Lumina Foundation and Gates Foundation are examples of organizations that helped gain a resurgence of performance-based funding in the early 2000s in response to the Complete College America initiative (Hillman et al., 2015; Tandberg & Hillman, 2014). This resurgence was possible by the donation of millions of dollars from both the Lumina Foundation and Bill and the Bill and Melinda Gates Foundation as an effort to increase college completion rates in efforts to stimulate the economy (McKeown Moak, 2013). However, the precise roles that these types of nonprofit organizations serve in the implementation of performance-based funding models is debatable, as these organizations have used coercive tactics by offering financial support to states and through written publications to advocate for performance-based funding measures (Gándara et al., 2017; Miller & Morphew, 2017).

In this portion of the literature review, I provide a clear explanation of funding in order to better understand the reasoning behind the implementation of the latest performance-based funding models. This broad description of higher education funding was investigated in effort to provide adequate information to help achieve data maturation and to eliminate any biases that may have existed between myself and the contents of the study. Higher education has gone through various stages of funding since its inception, including base-plus funding (Hearn, 2015), enrollment-based funding (Callahan et al., 2017; Hearn, 2015) and performance-based funding (ASHE, 2013b; Dougherty & Reddy, 2013; Ellis, 2015; Hearn, 2015; Li & Kennedy, 2017; Rosinger, 2020). The evolution of higher education funding is shown in Table 1 as I outlined base-

plus funding (i.e., funding based on using previous year's budget as a starting point f or succeeding year's budget [Hearn, 2015]), enrollment-based funding (i.e., funding based on admission of students [Hearn, 2015]), and performance-based funding (i.e., funding based on the achievement student outcome metrics (Hearn, 2015; Li & Kennedy, 2017; Rosinger et al., 2020). As also shown in Table 1, performance-based funding has gone through two primary stages, performance-based funding 1.0 and performance-based funding 2.0 (Dougherty et al., 2013; Dougherty & Reddy, 2013).

Table 1

Stages of Funding in Higher Education

Funding Type	Dates and Prominence	Funding Description
Base-plus funding	1800s-1970s	Incremental type budgeting where the prior year's budget rolls to the succeeding year, plus any new appropriations.
Enrollment-based funding	After World War II (1950s)	Funding based on the number of students or student contact hours generated.
Performance-based funding 1.0	1979 - Present	Performance-based funding that is awarded to colleges or universities as a bonus or in addition to the normal state appropriation.
Performance-based funding 2.0	2012 - Present	Performance-based funding that is awarded to colleges or universities as a part of the normal state appropriation.

Note. Funding types are not necessarily chronological in nature. State policymakers may implement multiple funding types or blended funding models.

As discussed in the following sections of this review, performance-based funding 1.0 is funding awarded to colleges and universities as a bonus for achieving outcome

metrics (ASHE, 2013a; Dougherty & Reddy, 2013; Hearn, 2015; Li & Kennedy, 2017) and performance-based funding 2.0 is funding awarded to colleges as part of the normal state appropriation (ASHE, 2013a; Dougherty et al., 2013; Dougherty & Reddy, 2013; Hearn, 2015; Li, 2016; Zumeta & Li, 2016).

Base-Plus Funding

Hearn (2015) described the first phase of higher education funding, beginning in the 1800s as *base-plus funding*, which he described as a type of incremental budgeting, which continued predominantly through the 1970s. State officials who adopted a base-plus budgeting model used the previous year budget as a starting point to create the following annual or semi-annual budget (Hearn, 2015). Base-plus funding occurred from the conversations between policymakers and leaders of institutions on amounts needed for operations (Callahan et al., 2017). However, these funding models were built based on historical costs and needs, and state policymakers did not factor individual college or university mission in the creation of these models (Callahan et al., 2017).

In their book *Budgets and Financial Management in Higher Education,* Barr and McClellan (2018) described incremental budgeting as a type of budgeting method where universal across-the-board percentage changes are made to a budget for a college based on the previous year's base allocation (Barr & McClellan, 2018). Moreover, the establishment of incremental-based budgeting is built on two key assumptions: (a) that the current budget is sufficient in order to meet any existing or changing institutional priorities for the succeeding year and (b) there is an existing level of stability in regard to institutional needs from year-to-year (Barr & McClellan, 2018). Revenue growth and politics are major drivers of this funding strategy (Hearn, 2015).

Advantages of base-plus budgeting include ease of implementation and low administrative costs (Hearn, 2015). Administrative costs are often reduced, and implementation is eased for administrators as there is not a need to analyze student enrollments or other economic conditions with base-plus funding (Hearn, 2015). Moreover, colleges and universities have a high level of discretion with base-plus funding modes on how funds are expended (Hearn, 2015).

Critics of incremental budgeting have noted several additional weaknesses to this model, which includes the inattention to the actual need of the institution and the failure of the model to "respond to changes in institutional priories, market forces, or emerging opportunities" (Barr & McClellan, 2018, p. 81). This assumption that institutional needs are not addressed is consistent with Callahan's et al. (2017) belief that base-plus funding models do not conform to colleges' or universities' missions. Moreover, some colleges may consist of systems that control their individual institutions' funding prior to dissemination of funds to each campus, and as a result, school officials may implement various budget strategies that differ from the initial purpose of base-plus budgeting (Hearn, 2015). Moreover, "based-plus approaches can potentially contribute to budgetary instability, insensitive targeting, and ineffectiveness" (Hearn, 2015, p. 5).

Enrollment-Based Budgeting and Early Performance Funding

After World-War II, college funding based on enrollment of students increased dramatically due to the distribution of G.I. Bill subsidies (Hearn, 2015). This sudden increase in enrollment after the 1950s caused many state policymakers to shift funding models from incremental base-plus models to enrollment-based models (Callahan et al., 2017). Unlike base-plus funding, enrollment-based funding is complex and requires the

reliance on data for forecasting purposes (Hearn, 2015). Moreover, funding based on enrollment formulas emerged as a response to educational inequality and a reaction to the surge in population in the United States (Hearn, 2015). Further, the focus of student enrollment correlated with new state goals to improve access for students (Hearn, 2105). Dramatic increases in student enrollment in colleges and universities have been an outcome of enrollment-based funding, however, it has been more difficult to correlate these increases in enrollment to graduation rates or certification completion rates (Hearn, 2015). As decisions are made to base funding on student enrollment, the importance of the completion of other student outcomes are diminished, often resulting in an increase in enrollment with little or no change to outcomes (Hearn, 2015).

Early Performance Based Funding and Performance-Based Funding 1.0

Many of the early performance-funding models were built in the 1980s and 1990s when the United States experienced strong economic growth and state policymakers were able to distribute more funds to institutions (Nisar, 2015). A major component of these types of performance-based funding programs at the time included rewards for inputs, rather than outputs, that were "aimed at influencing organizational design and structure" (Nisar, 2015, p. 292). These rewards for inputs in the early performance-funding models included rewards for increased enrollment, compared to the later performance-based funding 2.0, where funding for outputs (i.e., graduation rates) were rewarded to colleges and universities (Nisar, 2015). Many state policymakers began to discard early performance-models when they noticed that these models had little effect on enrollment during fluctuating economic shifts (Dougherty et al., 2013).

The turn of the century was viewed as a resurgence and a level of new accountability in higher education funding (Nisar, 2015). This new level of accountability called for direct governance of funding for higher education which was rationalized by the perceived need of social responsibility in academia (Nisar, 2015). As data systems were developed for reporting purposes to evaluate outcome indicators (e.g., degree awarded, time to completion, etc.), state policymakers realized that simple reporting statistics did not increase institutional performance (Zumeta & Li, 2016). As a result, many states policymakers began tying funding to the achievement of outcomes (Zumeta & Li., 2016).

The method of how policymakers implement performance-based funding policies and strategies differ from state to state (Rosinger et al., 2020). These changes are apparent in how systems are "subject to performance funding, the percentage of funds linked to student outcomes, the metrics on which institutions are evaluated, and whether and how equity metrics are defined." (Rosinger, et al., 2020, p. 1). States policymakers who have implemented performance-based funding 1.0 models have designed their funding models to allocate a *bonus* that distributed funds above the normal state appropriation in response to specific indicators or performance measures (ASHE, 2013b; Dougherty & Reddy, 2013; Hearn, 2015; Li & Kennedy, 2017). Performance-based funding 1.0 models were created primarily as a supplement to traditional formula-funding models, rather than a replacement of pre-existing funding models (Hearn, 2015). For performance-based funding initiatives to be successful, institutions should be provided performance funding in addition to any base appropriation, which would encourage college and university administrators to recruit minority students (Ellis, 2015). The size

of the bonus has been inconsistent nationwide, as this bonus allocation has been dependent upon state policymakers' decisions regarding allocation of funds, ranging anywhere from 1.0% - 5.0% of the total state allocation for that specific college (Dougherty & Natow, 2009; Dougherty & Reedy, 2013; Snyder, 2015). Lahr et al., (2014) argued that the allocation of funds for performance-based funding 1.0 was typically 1.0% to 2.0% of the total state allocation. Most of the college and university funding during this time was still based on historical enrollment numbers and traditional base-plus funding models (Callahan et al., 2017). The first state to implement this early form of performance-based funding was Tennessee in 1979 (Callahan et al., 2017; Dougherty & Reedy, 2013; Gándara, 2020, January 12; Hayes, 2017; Hearn, 2015; Kelderman, 2019; Mayes, 1995; Nisar, 2015). In 1985 Connecticut became the second state where policymakers implemented performance-based funding strategies, followed by Missouri and Kentucky in 1992 (McLendon & Hearn, 2013).

In recent years there has been a resurgence of performance-based funding and new level of accountability placed on colleges and universities, as many states' lawmakers have opted out of early performance-funding models to tie a larger portion of their funding to performance (Nisar, 2015). This accountability included a change in governance that ensured that colleges and universities administrators were aware of their social responsibilities (Nisar, 2015). By 2000, this shift in accountability led to at least 30 states' policymakers implementing some version of performance-based funding into their funding strategies (Hearn, 2015; Hillman, 2016). In 2020, 33 states' policymakers either already implemented performance-based funding or were working towards the

implementation of performance-based funding for the state's colleges and universities (Rosinger et al., 2020).

Performance-Based Funding 2.0

Performance-based funding 2.0 is a departure from performance funding 1.0, as the stakes are higher for institutions with this funding model (Zumeta & Li, 2016). In performance-based funding 2.0 models, states' policymakers do not allocate funds above and beyond original appropriated funds for met outcomes, but instead, incorporate outcome measures as a part of the original base appropriation (ASHE, 2013b; Dougherty et al., 2013; Dougherty & Reddy, 2013; Hearn, 2015; Li, 2016; Zumeta & Li, 2016). Moreover, performance-based funding 2.0 is a funding strategy aimed at improving the performance of an institution, because the formula is embedded into the existing funding strategy and cannot be easily disregarded by institutions (Dougherty et al., 2013). As previously mentioned, one of the most active organizations that has advocated for the newly refined performance-based funding 2.0 measures is Complete College America (Tandberg & Hillman, 2014). As of July of 2020, thirty-four states were a part of the Complete College America Alliance (Tandberg & Hillman, 2014). This resurgence led by Complete College America with the support of the Lumina Foundation and Bill and Melinda Gates Foundation, led to an influx of other states' policymakers refining or creating new performance-based funding models (Tandberg &Hillman, 2014).

State policymakers may implement performance-funding measures based on the assessment of prior existing performance-based funding 1.0 measures (Dougherty et al., 2013). However, despite an emphasis to funding institutions based on enrollments, colleges and university administrators have relied significantly on enrollment-based

funding as a major revenue drive (Zumeta & Li, 2016). Enrollments serve as a major source of revenue in colleges and universities with performance-based funding 2.0 measures, specifically among students who are more likely to be successful [i.e., not economically disadvantaged] (Zumeta & Li, 2016).

National Makeup of Performance-Based Funding

Due the lack of direct relationship between the federal government and higher-education funding, performance-based funding models are primarily implemented at the state level (Nisar, 2015). Moreover, the method of how colleges and universities are governed across the nation and within the states vary and are complex (Education Commission of the States [ECS], 2017). State governing structures vary and are a mix between coordinating boards or governing boards at both the state and system level (ECS, 2017). Twenty states, including Texas, are governed by a sole coordinating board or agency type that oversees the keys aspects of the state's role in all public higher education institutions; eight states are governed by a governing board that oversee public higher education systems and has broad authority; 19 states have one or more governing boards budget do not have any statewide governing boards; and 11 states are associated with administrative agencies that oversee various programs (ECS, 2017).

There is no clear agreement on how many states have implemented performance-based funding strategies (Kelchen & Stedrak, 2016). This level of uncertainty is partially a reflection of the various methods that funding models are implemented by state policymakers and how these policymakers tie certain outcomes driven measures to state funding (Kelchen & Stedrak, 2016). Moreover, state governance, as previously

explained, may serve as a factor in how decisions are made at the state level for funding purposes.

Twenty-nine states' policymakers have already funded colleges or universities state appropriated funds with at least some level of dissemination of funding based on the completion of student outcome measures (Rosinger, et al., 2020). MacKellar (2016), as a representative of the NCSL, identified 31 states that had some sort of performance funding tied to the completion of outcomes. For the purpose of this literature review, I used the latest data available from Rosinger et al. (2020) to describe state action with performance-based funding. Rosinger et al., (2020) characterized states into four categories in relation to their connection with performance-based funding: (a) states with colleges or universities without any level of performance-based funding; (b) states with colleges or universities with at least a portion, or all, of state funding allocated based on completion of outcomes; (c) states with policymakers currently implementing some level of performance-based funding, but not yet implemented; and (d) states with policymakers who have not implemented any level of performance-based funding and are not in the process of doing so. Listed in Table 2 are each state categorized by the status of performance-based funding for colleges and universities located in each state as outlined by Rosinger et al. (2020).

Table 2

States with Performance-Based Budgeting

State	Institution Type
Alabama	Community College Only
Arkansas	Community College; University
California	Community College; University
Connecticut	Community College; University
Florida	Community College; University
Hawaii	Community College Only
Illinois	Community College Only
Indiana	Community College; University
Kansas	Community College; University
Kentucky	Community College; University
Louisiana	Community College; University
Michigan	Community College; University
Montana	Community College; University
Nevada	Community College; University
New Jersey	University Only
New Mexico	Community College; University
North Carolina	Community College Only
North Dakota	Community College; University
Ohio	Community College; University
Oklahoma	Community College; University
Oregon	Community College; University
Rhode Island	Community College; University
Tennessee	Community College; University
Texas	Community College Only
Utah	Community College; University
Virginia	Community College; University
Washington	Community College Only
Wisconsin	Community College; University
Wyoming	Community College Only

Note. States listed do not include states where state policymakers may in progress of implementing performance-based funding.

Additionally, as previously mentioned, not all states have implemented performance-based funding in the same manner (Kelchen, 2016; Kelchen & Stedrak, 2016). While most states policymakers have implemented policies that apply to both 2-year and 4-year institutions, some state policymakers implemented performance-based

funding measures to only 2-year institutions, while one state's policymakers (i.e., New Jersey) have implemented performance-based funding measures to only 4-year institutions (Rosinger et al., 2020).

Moreover, the percentage of funding that was reserved for the achievement of performance outcomes during the 2020 fiscal year varied, depending on policies that were passed at the state level (Rosinger et al., 2020). For example, Ohio allocates 100% of state funding based on the achievement of student outcomes (Rosinger et. al, 2020). Tennessee, the first state to implement any type of performance-based funding in 1979 (Gándara, 2020, January 12; Kelchen, 2018; Mayes, 1995; NCLS, 2015), allocates just approximately 85% of state college and university funding on the basis of achieving student outcome measures (Hillman et al., 2018). Kentucky policymakers have allocated 70% of state allocated funding to the achievement of outcome measures (Kentucky Council on Postsecondary Education, 2016). Other states' policymakers have chosen a less aggressive method of distributing funds based on performance. Nevada policymakers have allocated 20% of state-appropriated funds to institutions based on outcome achievement and have afforded the opportunity for institutions to earn back unearned funds from the first year of the budget cycle in the second year of the budget cycle (Nevada System of Higher Education, 2018). Texas policymakers allocated 10% of overall community college state funding based on performance measure (THECB, 2019) and performance-based funding is limited to Texas community colleges (TACC, 2019). Arkansas allocates just 3% for the completion of student outcomes (Arkansas Department of Higher Education, 2018).

State Action and Impact of Performance-Based Funding

Various state legislators, regardless of political stance, have adopted performance-based funding strategies (Rosinger et al., 2020). As previously mentioned, the exact number of states participating in performance-based funding is ambiguous due to varying definitions of the funding measure (Kelchen & Stedrak, 2016). In 2015, the NCSL outlined 30 states that adopted some type of performance-based funding model and implemented metrics associated with performance-based funding for that state. As previously mentioned, Rosinger et al. (2020) identified 29 states that are currently implementing some method of performance-based funding. Of the 29 states that have adopted funding measures based on the achievement of outcomes, seven states' policymakers have limited their performance funding measures to 2-year colleges, one state's policymakers have limited performance funding to 4-year colleges, and the remainder 21 states' policymakers include both 2-year colleges and 4-year colleges as part of the states' performance funding structures (Rosinger et al., 2020).

In the following section of this literature review I described various states' policymakers' strategies for implementing performance-based funding. I examined both Tennessee's and Ohio's model of performance-based funding. Both Ohio and Tennessee are routinely cited in literature as exemplars of best-practices for performance-based funding (Snyder, 2015). Moreover, I drew upon existing research from Hillman et al. (2018) and their listed rationale for including Ohio and Tennessee in comparison analysis: (a) weight of degree completion in comparison other performance measures; (b) both state policymakers use performance-based funding as a part of the appropriation rather than a bonus; and (c) colleges and universities located within these states have a

long history of performance-based funding. Consistent with the research purposes of Hillman et al. (2018), I sought to research literature on the implementation and outcomes of performance-based funding in these states' colleges and universities, as both of these states are often mentioned as best practices for implementation and performance.

Texas

As previously mentioned, Texas public postsecondary institutions are governed by a single coordinating board (ECS, 2017). For the 2018-2019 biennium, community colleges, technical colleges, and state colleges received 10.80% of the overall state-allocated funding for Texas public postsecondary institutions (Legislative Budget Board, 2019). General academic institutions received 37.80% of state allocated funding for the 2018-2019 biennium. Before the beginning of the 83rd Texas Legislature, the beginning of the 2014-2015 biennium, both the TACC and the THECB joined and introduced a budgeting plan that funded community colleges state-appropriated funding based on three major areas: (a) core operations (i.e., each community college system receive $1,400,000 to assist with operating costs); (b) contact hour funding (i.e., $2.70 per contact hour generated); and (c) student success points (Legislative Budget Board, 2019; TACC, 2019).

With the passing of this legislation, Texas policymakers adopted an 11-metric funding system in 2013 that measures a community colleges' progress toward the completion of credentials (Fraire, 2019, April 9; TACC, 2019). Although Texas community college funding is not entirely based on the adoption of these new outcomes, 89% of community college funding is still tied to the generation of student contact hours, which is generated as a result of enrollment, and 11% of community college funding is

based the generation of student success points (THECB, 2017a). The percentage of funds allocated to the generation of success points rose slightly since the 10% allocated at the inception of Texas' performance-based funding plan in 2013. These performance measures are indicative of the accomplishment of completion of a student's first semester in community colleges, as well as the student's first year in college (Fraire, 2019, April 9). In Texas, only community colleges have some sort of performance-based funding measure implemented (Rosinger et al., 2020). Although Texas policymakers have convened to discuss a single model that would be applicable to both community colleges and universities, this type of model is not likely (Ellis, 2015). Moreover, larger flagship institutions in Texas have the necessary resources to respond to state-mandated performance outcomes, but smaller institutions may struggle to meet those demands financially (Ellis, 2015).

Student Success Points. Success points were established in 2013 when state lawmakers passed performance-based funding measures for all 50 Texas public community colleges (Fraire, 2019, April 9). According to Fraire (2019, April 9), student success points were implemented to meet the needs of the least prepared to the most prepared college students. According to the THECB (2019), success points were developed in a way to increase rates of student progression and student achievement. These success points, according to the THECB (2019) are attainments that are correlated with specific milestone completions. When student success points were implemented by Texas state legislators, success points were weighted at $185.00 per generated success point (Fraire, 2019, April 9). As of the 2018-2019 biennium, the rate per student success points has decreased by $13.00 per student success point; $172.00 per success points

(THECB, 2019). Moreover, not all performance metrics are weighted equally per student outcome. Indicated in Table 3 are the 11 metrics, along with the explanation of how those metrics are funded and calculated.

Table 3

Success Point Metrics for Texas Community Colleges

Metric	Success Points Awarded
Student completes Texas Success Initiative assessment and becomes Mathematics ready after enrolling in developmental education	1.0 Success Points
Student completes Texas Success Initiative assessment and becomes Reading ready after enrolling in developmental education	.50 Success points
Student completes Texas Success Initiative assessment and becomes Writing ready after enrolling in developmental education	.50 Success Points
Student successfully completes first college-level Mathematics course	1.0 Success Points
Student successfully completes first college-level Reading course	.50 Success Points
Student successfully completes first college-level Writing course	.50 Success Points
Student successfully complete 15 semester credit hours	1.0 Success Points
Student successfully completes 30 semester credit hours	1.0 Success Points
Student earns a degree or certificate in a field that is not critical	2.0 Success Points
Student earns a degree or certificate in a STEM or other critical field	2.25 Success Points
Student transfers to a university after successfully completing at least 15 semester credit hours	2.0 Success Points

Note. Success point metrics are current as of the 2020-2021 biennium. Points do not reflect any changes made in any succeeding biennium cycle.

Measure #1, #2, and #3 College Readiness in Mathematics, Reading, and Writing. Texas community colleges are awarded 1.0 success point per each student who meets TSI standards in mathematics in the year measured (TACC, 2019; THECB, 2019). Texas community colleges are awarded .05 success points per each student who meets TSI standards in reading or writing in the year measured (TACC, 2019; THECB, 2019). This point distribution to community colleges is only available for students who were not college ready prior to the successful completion of developmental education (THECB, 2019). The Developmental Education Initiative that received funding from Bill and Melinda Gates Foundation and Lumina Foundation helped many state policymakers in the development of performance-based funding programs that assigned funding for community colleges for progressing students through developmental education (Achievement the Dream, n.d.). Students who are not *college ready* are required to take remedial education in either English courses or mathematics courses that will not count as credit towards the student's degree (Bailey et al., 2015). Of all students entering community colleges, 60% of these students must be admitted into developmental education courses (Achieving the Dream, n.d.). This percentage increases to 90% for some community colleges admitting Black students and low-income students (Achieving the Dream, n.d.). However, explained later in the literature review, students with the shortest path out of developmental education generate more success points for community colleges than students with a longer path out of developmental education (McKinney & Hagedorn, 2017).

Measure #4, #5, and #6 Completion of First College-Level Mathematics, Reading, and Writing Course. Texas community colleges are awarded 1.0 success point

per each student who successfully completes their first college-level mathematics course with a grade an A, B, or C and .05 success point per each student who successfully completes either their first college-level reading course or their first college-level writing course with a grade of an A, B, or C (THECB, 2019). Texas community colleges are awarded; 1.0 success point for completing both college-level reading and college-level writing with a grade of an A, B, or C (THECB, 2019). The completion of a student's first college-level mathematics, reading, or writing course is often a way to assess how, or if, remedial education courses are helping students who are underprepared (Bailey et al., 2015). However, studies have shown that students who are just below the college ready threshold (i.e., student who require only one developmental education course) do not have an increased likelihood of long-term success (Bailey et al., 2015). Moreover, students who are who required to complete two or more developmental courses are more than likely never to complete a college-level mathematics, reading, or writing course.

Measure #7 and #8 Successful Completion of 15 and 30 Semester Credit Hours. Texas community colleges are awarded 1.0 success point per when each student completes 15 SCHs and 30 SCHs while attending the same district or system in the year measured (THECB, 2019). As previously discussed, the THECB will revise the amount per student FTE in the 2022-2023 Appropriations Act to 2.75 points from the current 1.0 points (THECB, 2019). This type of outcomes is known as a progressive outcome, separate from degree completion. These types of progressive metrics, or milestones, are rewarded for the steps in completing a degree and not solely in the completion of the degree itself (Li, 2018).

Measure #9 Degree, Certificate, or Core Completion. Texas community colleges are awarded 2.0 success points per each student who completes a degree, receives a certification, or completes requirements for core completion in the in the year measured (THECB, 2019). As previously mentioned, the THECB will revise the amount per student FTE in the 2022-2023 Appropriations Act to 1.2 points from the current 2.0 points (THECB, 2019). All performance-based funding models in the U.S. have some sort of metric tied to either retention or course completion (Li, 2017).

One of the major goals of policymakers who implement performance-based funding for their colleges is to promote the attainment of education (Li, 2017). Completion can either be measured by the number of decrees produced or by the graduation rates of students who complete their degree within 150% of the average completion time (Li, 2017). Despite completion metrics as seen in Texas' performance-based funding model and every other model in the country, these funding measure often do not deliver the intended results and in some cases produces negative results in completion (Li, 2017). As discussed later in this literature as an unintended consequence, many colleges may strive to award more certificates than degree due to funding priorities of certificate completion (Li, 2017). Although some state policymakers have adapted their funding metrics to give more weight to degree completion than certificates (Li, 2018), Texas policymakers distribute the same weight for either degree completion or certificate completion (THECB, 2019).

Measure #10 Degree or Certificate in Critical Field. Texas community colleges are awarded 2.25 success points per each student who completes a degree, or certification in a Science, Technology, Engineering, or Mathematics (STEM) field, or, is a major in

allied health (THECB, 2019). As previously discussed, the THECB will revise the amount per student FTE in the 2022-2023 Appropriations Act to 3.0 points from the current 2.25 points (THECB, 2019). As seen from Texas' community college performance-based funding model, more weight is assigned to degree completion in a critical field (e.g., STEM fields) than any other outcome (THECB, 2019).

Institutions that heavily favor STEM production and degree programs are more likely to financially benefit from the distribution of performance-based funding, as many performance-based funding models are assigned extra weight outcome metrics in STEM fields (Ellis, 2015). In 2015, 13 states included a separate performance metric solely associated with the completion of STEM degrees (Li, 2018). Moreover, institutions that offer STEM degrees with a performance outcome associated with those degrees award 11% to 12% more STEM degrees than institutions that are not awarded for STEM degree completion (Ellis, 2015).

Measure #11 Transfer to University with 15 Semester Credit Hours Completed. Texas community colleges are awarded 2.0 success points per each student who completes at least 15 semester credit hours and transfers to a university (THECB, 2019). Earned semester credit hours must be completed in the last three years prior to transferring to a 4-year institution. As previously mentioned, a best practice of performance-based funding models is to build a model that is differentiated between institution type (Li, 2017). Although Texas performance-based funding models apply to only 2-year institutions (Ellis, 2015), the inclusion of transfer language in the outcome measures are consistent with many community colleges' missions, rather than just degree completion. Moreover, this transfer measure consists of a progressive measure (i.e.,

completion of 15 SCHs) which is an important component of performance-funding models (Li, 2017).

Summary. Texas performance-based funding, implemented in 2013 by state policymakers (Fraire, 2019, April 9; TACC, 2019) assigned the highest weight and consideration to STEM degree completion (THECB, 2019). Consistent with every other state in the country (Li, 2017), Texas policymakers have assigned weight to the completion of degrees. However, a disadvantage of the models may be that equal weight is assigned to degree completion and certificate completion. As previously discussed, the equal weight of degree and certificates (THECB, 2019) may result in the awarding of more certificates, which may lower degree completion (Li, 2017).

Moreover, the same weight is assigned to degree completion and certification completions (THECB, 2019). One major advantage of the Texas performance-based funding model is that state policymakers have earmarked additional funding for progressive metrics. These progressive metrices (e.g., completion of 15 SCHs and completion of 30 SCHs) allow for colleges and universities to be rewarded for the journey to degree completion and not just degree completion itself (Li, 2017).

Texas policymakers have not assigned a metric that is solely based on the admission of minority students or economically disadvantaged students. Colorado became the latest state where policymakers have assigned a metric directly based on the admission of minority students and low-income students, assigning 20% of the states' performance funding to minority enrollment and 20% of the state's funding to low-income enrollment (Gonzalez, 2020, June 1). Although Texas state policymakers have assigned weight to the completion of developmental education (THECB, 2019), research

has shown that Black students are funded at a lower level than Asian students and the longer students stay in developmental education, the less funding they procure (McKinney & Hagedorn, 2017). Moreover, the structure of the Texas performance-funding policy is homogeneous to all 50 Texas community colleges. Some colleges who serve more economically disadvantaged students may be benefit differently from specific performance measures.

Although the Texas performance-based funding model has progressive metrics which has been deemed an important component of performance models (Li, 2017), this performance model does not account directly for non-traditional students. These students may include workforce students who only complete a few hours to gain much needed skills for the workplace. Moreover, the model does not account for funding of students who transfer to a university with less than 15 semester credit hours. Additional research may be necessary to investigate the negative consequences of early transfers and the lack of inclusion of a staggered point system to account for the academic success of all community college students in Texas.

Tennessee

As previously mentioned, Tennessee policymakers were the first to implement any type of performance funding measure in 1979 (Gándara, 2020, January 12; Hanes, 2017; Mayes, 1995; McKinney & Hagedorn, 2017, NCLS, 2015) and this program is the longest running performance-based funding program in the nation (Hillman et al., 2018). When performance-based funding was implemented in Tennessee in 1979 a major goal of state policymakers was to address public concerns of performance assessment and to address concerns with enrollment formula models (McLendon & Hearn, 2013).

Tennessee policymakers had the support of several organizations such as the Kellogg Foundation and the Ford Foundation and performance-based funding was piloted at several Tennessee campuses (McLendon & Hearn, 2013).

From the implementation of formula-funding measures in 1979 and 2011, Tennessee colleges and universities were funded primarily according to the student enrollment (Ogerbfell, 2018) and only 5.0% of state-allocated funds were based on performance (Hillman et al., 2018). In 2010, the Complete College Tennessee Act was signed into law and this funding model was designed in 2018 to allocate approximately 85% of the state's funding for colleges and universities to student enrollment, while only 15% of the state's funding was aligned toward the completion of goals and measures (Hillman et al., 2018; Ogerbfell, 2018). Tennessee has sense been regarded as an exemplar for performance, or outcomes-based funding (Callahan et al., 2017). Tennessee was classified by HCM Strategies as an advanced example of performance-based funding in 2015 and 2016 for several reasons: (a) state policymakers focus on completion as a primary component of performance metrics that aligned with state policymakers' goals; (b) focus and prioritization of at risk students; (c) differing metrics and outcomes between 2-year and 4-year colleges; (d) high level of funding based on the completion of outcomes; and (e) longevity of the performance-based funding model since the 2010 revision (Callahan et al., 2017).

The governing board of Tennessee public institutions, The Tennessee Higher Education Commission in the 2015-2020 funding model reserved just under 78% of the state's funding to the performance of outcome measures and funds colleges and universities based on a 3-year average of achieved outcomes by institutions (Testa, 2017).

Tennessee policymakers implemented measures to revise Tennessee's funding formula every five years (Ogerbfell, 2018; Testa, 2017).

Moreover, Tennessee's performance funding model includes outcomes that are designed to help low income and at-risk student populations (Testa, 2017). For community colleges, the outcomes of remedial and developmental success were replaced with academically underprepared students (Testa, 2017). Moreover, for universities, the metric of transferring out with 12 SCH was removed and the metric of degrees awarded for every 100 full-time equivalent students was revised to include only degree seeking students in the population sample (Testa, 2017).

Ohio

Ohio consists of 23 two-year colleges and 13 universities (Hillman et al., 2018). Prior to 2009, Ohio policymakers did not incorporate performance funding as part of the base budget but did so in 2009 after passing additional legislation (Hillman et al., 2018). In 2014, Ohio policymakers revised its performance-funding model to include community colleges, who were to be funded by degree completion, ability to transfer to a senior institution, and various other outcome measures (Boerner, 2014, July 23). According to Hillman et al. (2018), performance-based funding for 2-year colleges in Ohio are based on the completion of progress indicators (e.g., course and credential completion). Of all Ohio university performance-based funding, 80% is connected to course and degree completion and 20% of performance-based funding is connected to other workforce and STEM related goals (Hillman et al., 2018).

Recent data has shown that the 100% funding model for community colleges have increased various performance in the measures of degree or certification attainment for

students (Ohio Association of Community Colleges [OACC], 2019). Specifically, there was an 8.50% increase in the number of students who have earned credentials and a 22.50% increase in students who earned one-year certificates, despite declining economic conditions (OACC, 2019).

Impact of Performance-Based Funding for Ohio and Tennessee

As previously mentioned, Ohio and Tennessee were the forerunners of performance-based funding and used as best practices and exemplars in relation to performance-based funding (Hillman et al., 22018; Snyder, 2015). Due to the amount of attention placed on Ohio and Tennessee from various states' lawmakers, evaluating the success, or failures, of performance-based funding has been beneficial due to the longevity of the program in these states, which may be beneficial to states' policymakers in making decision regarding their state's funding strategy (Hillman et al., 2018). Hillman et al., (2018) applied the principal-agent theory as a guiding theoretical framework in their study analyzing performance-based funding outcomes of both Tennessee and Ohio colleges and universities. Both Ohio and Tennessee community colleges produced less certificates per year than the national average after performance-based funding measures were implemented (Hillman et al., 2018). Tennessee community colleges produced more associate degrees than the national average and Ohio community colleges produced approximately the national average in number of associate degrees (Hillman et al., 2018). Bachelor degree completion rates for universities in Ohio and Tennessee were above the national average (Hillman et al., 2018).

Moreover, it took approximately 4 to 5 years after the implementation of performance-based funding for certificate attaining to surpass the national average for

Ohio community colleges, although degree certificate awards grew steadily since the implementation of performance-based funding (Hillman et al., 2018). In Tennessee, prior to performance-based funding, community college production of student certificates was well below the national average and stagnant until the implementation of performance-based funding (Hillman et al., 2018). Immediately after implementation of the new funding strategy, student certificate achievement rose considerably, outpacing the national average. Associate degree attainment for students attending community colleges that were funded based on performance increased for the first 2 years after implementation (Hillman et al., 2018). These data indicated that performance-based funding had a stronger impact on certificate completion than degree completion and that community colleges degree completion rates in Ohio and Tennessee did not outperform other students in regard to production of degrees (Hillman et al., 2018). States' community colleges where policymakers implement more traditional and less aggressive funding models may produce similar type of results than colleges where policymakers implement performance-based funding models (Hillman et al., 2018). Evidence is suggestive that the funding models for both Ohio and Tennessee produced lower productivity of degrees (Hillman et al., 2018).

Institutional Administrative Reaction to Performance-Based Funding

A challenge that state policymakers have experienced with the distribution of performance funding has been the diversity of institutional types that require funding. Historically Black Colleges and Universities have benefited less than other universities from the implementation of performance-based funding measures (Sav, 2010). Likewise, community college activities are too broad to be all inclusive in the development of

performance-based funding models (Thornton & Friedel, 2015). As such, community colleges have open-access procedures that contribute to the admission of low-income and at-risk students (Davidson, 2015). Low-income or at-risk students had negative correlations with graduation rates (Davidson, 2015). I sought to specifically focus on Community Colleges and Historically Black Colleges and Universities in this section of the literature review in response to researchers that have examined how performance-based funding may disincentivize or penalize colleges leaders where admitting at-risk or disadvantaged students are a part of the college's mission.

Community Colleges

State policymakers have done a poor job in the recognition of multiple missions across colleges and have failed to recognize any differences in student characteristics in the implementation of student outcomes (McKinney & Hagedorn, 2017). When factoring student demographics and certain trends in state-allocated funding based on those demographics and student groups, more funding is distributed per student who is enrolled in developmental coursework than students not enrolled take developmental coursework (McKinney & Hagedorn, 2017).

Moreover, more funding to community colleges is distributed per student who is enrolled in developmental coursework than students not enrolled take developmental coursework (McKinney & Hagedorn, 2017). However, despite additional funding per student enrolled in developmental coursework, Black men and holders of GEDs attending community colleges were more likely to produce less performance-based funding for the respective institution and that Asian students, full-time students, and students who received Pell Grant funding accounted for more performance-based funding than other

student groups (McKinney & Hagedorn, 2017). Community college students who required just one developmental mathematics course earned more performance-based funding than those students who entered community college college-ready (McKinney & Hagedorn, 2017). As mentioned in the unintended consequences portion of this literature review, institutional leadership may feel pressured to lower academic standards and advance students prematurely through developmental educational to meet performance outcomes (Dougherty et al., 2013). In Texas, although only approximately 10% of state-appropriated funding is based on performance outcomes, this percentage may represent a larger portion of a smaller institution's budget (Ellis, 2015). Moreover, smaller community colleges may become homogeneous in their course offerings to be consistent with funding measures, regardless of institutional mission.

Community college students assigned to the lowest levels of developmental educational earned the least amount of performance-based funding (McKinney & Hagedorn, 2017). These community colleges students may secure less funding because students who entered in community college at the highest level of developmental education received one success point for finishing and transferring to a college-level mathematics course, as opposed to those students who enter at the lowest end of developmental education (McKinney & Hagedorn, 2017). Community college students procured more success points if their path through developmental education was short, rather than longer (McKinney & Hagedorn; 2017). Texas state policymakers could include weight metrics that would award student success points for the progression of outcomes for students who are at-risk (McKinney & Hagedorn, 2017).

This differentiation of degree completion, student retention, transfer rates, and graduation rates between community colleges and 4-year institutions were key state indicators in the development of performance-based funding and how community colleges have addressed those performance indicators (D'Amico et al., 2014). A majority of states' policymakers implemented different performance funding measures for community colleges compared to 4-year universities (D'Amico et al., 2014). Nineteen states incorporated performance funding metrics in its community colleges funding models and 12 of the 19 states had different funding measures for 2-year schools, as compared to institutions.

Moreover, no institutional policy changes were made solely as a reaction to state performance-based funding at any of the observed institutions (Thornton & Friedel, 2015). Institutions are responsible for handling several outside institutional and state initiatives, apart from performance-based funding (Thornton & Friedel, 2015). However, to better understand the importance of the institution's role in serving their respective community and encouraged the creation of future longitudinal studies of Carnegie classified rural community colleges (Thornton & Friedel, 2015).

Historically Black Colleges and Universities

Although state funding for higher education has increased, Historically Black Colleges and Universities funding has remained stagnant (Jones, 2016). Performance-based funding measures are intended to create equity and additional opportunities for institutions of higher education, but these equity and opportunities rarely develop (Owens & Elliott, 2017). Historically Black Colleges and Universities in states with performance-based funding, received less funding than Historically Black Colleges and Universities in

states that did not implement performance-based funding models. Several key factors regarding performance-based funding and Historically Black Colleges and Universities exist, including: (a) performance-based funding does not address past disparities in funding for Historically Black Colleges and Universities; (b) Historically Black Colleges and Universities with the least amount of resources and are most at-risk have are not adequately represented on committees that design performance-based funding models; and (c) equity is not a priority, but an afterthought in the implementation of performance-based funding models (Owens & Elliott, 2017).

Specifically, the demographic makeup of students at Tennessee State University, consisted of 76% Black students and 65% of Black students who received Pell-Grant. As indicated earlier in this research investigation, Pell-Grants are used as a determinant in determining which students are economically disadvantaged and although additional metrics and weight are placed on low-income students, those metrics do not equate additional funding for Tennessee State University (Owens & Elliott, 2017). Disproportional amount of state allocated funding is appropriated to the University of Tennessee-Knoxville, which is considered the state's flagship university (Gándara et al., 2017; Owens & Elliott, 2017).

Moreover, imbalances of state funding between Historically Black Colleges and Universities and Predominantly White Colleges or Universities have been the result of fiduciary imbalances and discriminatory practices. Historically Black Colleges and Universities received less state funding compared to other institutional categories and much of this funding deficit in due to the possible discrimination of Historically Black Colleges and Universities. Moreover, Historically Black Colleges and Universities

received less state funding when comparing the same performance indicators set by the state to other institutions (Sav, 2010). Higher tuition costs have resulted in less state-appropriated funding, and although Historically Black Colleges and Universities were funded comparable to Predominantly White Colleges and Universities, Predominantly White Colleges and Universities received more funding based on graduate-level funding than Historically Black Colleges and Universities. Although the disparity between Historically Black Colleges and Universities' and Predominantly White Colleges and Universities' funding decreased between 1995 and 2006, theses changes in disparity may be due to the availability of survey data and the inability to collect complex performance-data measures for institutional comparison. These data could have been affected by the economic impacts of Hurricane Katrina (Sav, 2010).

Performance measures often include metrics such as access equity and degree-completion for low-income and Black students, which has caused some Historically Black Colleges and Universities to actively recruit students from other races to meet performance criteria (Jones, 2016). Additionally, university's leaders were not familiar with performance-based funding and its impact on the college (Jones, 2016).

Policy Diffusion

Policy diffusion occurs when state policies cross borders to neighboring states, as a result of what policymakers and decision makers observe and include in policy (Dougherty et al., 2016). A state's proximity in relation to other states was used in hypothesizing a direct correlation to the adoption of performance-based funding 2.0 of neighboring states to the likelihood of the adoption of performance-based funding 2.0 for the focal state (Li, 2017). However, despite the hypothesis of policy diffusion, as states

adopted performance-based funding 2.0 funding models, the likelihood of diffusion decreased, rather than increased. The process of decreased likelihood of policy diffusion is known as reverse policy diffusion (Li, 2017).

Moreover, there was correlations with political ideology of a state's makeup and the adoption of performance-based funding policies (Li, 2017). States with Republican-controlled legislatures, more professionalized legislatures, and rapid growth in unemployment rates are more likely to implement the policy, while those with higher education attainment levels and more bachelor's degrees awarded per student are less likely" (Li, 2017, p. 746). However, this higher likelihood to adopt performance-based funding measures was only apparent when both the legislative makeup and the governor of the state was Republican controlled (Li, 2017). Economic characteristics of states (e.g., per capital income increases) had no impact on the diffusion adoption performance-based funding policies (Li, 2017). For every point increase in unemployment, states were 3.0% more likely to adopt performance-based funding measures (Li, 2017). The reluctance of state adoption of performance-based funding 2.0 may be due to legislature's cautiousness of applying policy to their own political party and the state's desire to learn from other states (Li, 2017). This type of delay in decision making as a form of negative policy learning (Li, 2017).

Although results from the quantitative research study of Li (2017) indicated inconsistencies with the spread of performance-based funding, recent researchers have implemented qualitative measures to better understand the potential existence of policy diffusion (Gándara et al., 2017). Attention has focused on the role of intermediaries in the implementation of performance-based funding and its effects on policy diffusion

(Gándara et al., 2017). The Lumina Foundation has provided ongoing support to state policymakers for the implementation of performance-based funding methods (Hearn, 2015).

State policymakers have used similar rhetoric that was previously used by agenda-setting organizations in the development of their state's performance-funding models (Miller & Morphew, 2017). Moreover, agenda-setting organizations intentionally choose and limit the distribution of ideas and content, which may be noticed in areas of state policy decision making (Miller & Morphew, 2017). These published ideas often support other decisions that are made by other researchers, rather than the construction of additional research to the field (Miller & Morphew, 2017). Agenda-setting organizations have created literature associated with performance-based funding, which have worked against the policymakers' ability to better understand the area of performance-based funding, rather than benefit policymakers in the decision-making process (Miller & Morphew, 2017). However, these intermediaries, such as agenda-setting organizations have used reward tactics and sometimes punishment to ensure the adoption of performance-based funding measures and strategies (Gándara et al., 2017). Although these agenda-setting organizations do not have authoritative power over states legislators, they do have the ability to provide incentives to state policymakers and universities and may use shaming techniques in order to ensure compliance (Gándara et al., 2017). These incentives may be financially based, such as the Lumina Foundation's and Gates Foundation's philanthropic donations to ensure the funding of certain initiatives (Gándara et al., 2017). For example, Complete College America used punitive coercion techniques

by publishing each institution's low completion rates in a format that would be easily understood by others (Gándara et al., 2017).

Moreover, intermediaries exert normative pressures in order to encourage and facilitate performance-based funding diffusion and adoption of policy between the states (Gándara, 2017). A specific example of this was how performance-based funding was described as a best practice by Complete College America (Gándara et. al, 2017). Many states' college and university administrators have referred to performance-based funding as a best practice which was consistent with previously published literature by intermediaries such as Complete College America (Gándara, et al., 2017). Other words such as *common sense* and *game-changer* have been used in intermediary literature, which has been repeated by study participants at the state level (Gándara et al., 2017). Moreover, intermediaries "disregarded some research and act as gatekeepers of research evidence" (Gándara et al., 2017, p. 717). Many agenda-setting organizations have disregarded research in the field and acted as primary distributors of literature. This type of disregard has also come in the form of actively discrediting findings from other researchers (Gándara et al., 2017).

Complete College America has been very effective in their marketing efforts in multiple states (Gándara et al., 2017). Research participants commonly repeated verbiage or jargon that was originally included in pieced that were disseminated and published by Complete College America (Gándara, 2017). This repetition of dialogue has also been evident by policy and strategic initiatives that have been implemented statewide, which were in correlation with information disseminated by Complete College America

(Gándara, 2017) . Additional research is needed to examine the role of intermediaries in policy the policy diffusion of performance-based funding measures (Gándara, 2017).

Policy Implementation and Unintended Consequences of Performance-Based Funding

Several consequences for colleges and universities exists with the implementation of performance-based funding (Gándara et al., 2017). Performance-based funding models and strategies may produce outcomes that were not originally intended from state policymakers (Dougherty et al., 2016). One consequence is the that these funding models may force colleges and universities to be selective in their enrollment practices (Gándara et al., 2017). These admission restrictions also may be accompanied by academic standards that are weakened because of performance-based funding mandates (Dougherty et al., 2016). Necessary college courses may be cut in response to pressures for college or universities leadership in order to matriculate students (Dougherty et al., 2016). Moreover, colleges and universities may admit students who are more likely to be successful (Gándara et al., 2017; Lin, 2017), which disproportionately effects the admission rates of economically disadvantaged students and Black students (Gándara et al., 2017). Performance-based funding metrics may also disproportionally affect college by type or category (Dougherty et al., 2016). Colleges or universities that are already selective in their admission practices may not be inconvenienced by new performance-funding models, but community colleges with larger open-access admission policies may be greatly affected, including possible reconsideration of admissions policies (Dougherty et al., 2016). Colleges administrators who have open-access admission policies s may

shift recruiting efforts to certain school districts to recruit students with a higher likelihood of being successful in college (Li, 2018).

Moreover, funding comparisons have been apparent in comparing trends of colleges and universities that are funded by performances and colleges and universities that are not funded by performance (Gándara et al., 2017). Performance-based funding measures tend to disproportionately award certain flagship universities (Gándara et al., 2017; Owens & Elliott, 2017). An example of a college flagships receiving disproportional amount of funding was the University of Tennessee-Knoxville (Gándara et al., 2017). The more political weight university officials carried, the less that university received by the distribution of performance-based funding (Gándara et al., 2017). University administration and leadership buy-in was a major contribute to the lack of consequences for these flagship universities (Gándara et al., 2017). The more funds larger flagship colleges would lose with the implementation of performance-based funding metrics, the less likely state policymakers would implement these type of funding measures (Gándara et al., 2017). Iowa and West Virginia are two case studies where performance-based funding was not passed due to the amount of funding larger universities would lose as a result of implementation (Gándara et al., 2017).

There are two different policy implementation perspectives for performance-based funding, the top-down perspective and the bottom-up perspective (Lahr, et al., 2014). The bottom-up perspective emphasizes the need to understand the needs of those who would need to implement the policy (e.g., colleges or university administrators). Unintended impacts or consequences may occur when those who are implementing performance-based funding strategies cannot meet the goals of those who designed the

policy (Lahr et al., 2014). Moreover, the unintended consequences of the top-down perspective originate from the inadequacy from the policy designers and a failure to communicate, whereas the unintended impacts from the bottom-up perspective originate from differences in perspectives or understanding of the goals at both levels (Lahr et al., 2014). If those goals cannot be met, leaders may often resort to harmful actions in order to meet the goals of those who designed the policy, including the lowering of some institutional academic standards (Lahr et al., 2014). For community colleges, a major concern and potential unintended consequence may be a higher number of certificate completers (Li, 2017). This may be especially true for colleges with the same weight assigned to certificate completion and degree completions (Li, 2017). As such, state policymakers should consider market value of degrees in the distribution of incentives based on completion of outcomes (Li, 2017). This alignment can be done by distributing incentives based on market value of degree, or starting salary of a specific degree (Li, 2017).

Additionally, the designer and the implementer of the policy may share common goals, but there may be a disconnect between what these goals entail (Lahr et al., 2014). The principals (e.g., state policymakers and policy designers) and the agents (e.g., college and university leaders and administration) may share common goals, the interests of both the principal and the agent are often different (Lahr et al., 2014). Several impacts exist in evaluating the top-down perspective including (a) community college access restriction; (b) academic standards weakening; (c) cost of compliance; (d) decrease in morale of staff; (e) less emphasis on the mission of the college, and (f) decrease in academic faculty governance (Lahr et al., 2014).

Researchers have conducted studies that have shown that performance-based funding does not have positive impacts on baccalaureate degree production and that little quantitative research has been done to evaluate any unintended consequences of performance-based funding (Umbricht et al., 2017). Indiana public institutions had lower admission rates than that of any other comparison colleges in the study and admitted minorities at a rate of 20% less than compared public institutions (Umbricht et al., 2017). Although Indiana sought to increase graduation rates at public institutions, the funding strategy had an opposite effect of decreased enrollment (Umbricht et al., 2017). Moreover, there were notable differences in graduation rates from comparison institutions to comparison states. State characteristics had little determination on the performance of an institution and performance-based funding was not a sole determinant of performance (Shin, 2010). The lack of institutional performance, in response to new fiscal accountability measures, may not be a result of poor institutional execution, but rather, the state's inability to include these performance components in the new fiscal mandates (Shin, 2010).

If institutional performance is a product of the state's inability to connect performance components and fiscal mandates, institutions will need to answer how their institutional financial solvency is related to state funding and outcomes (Shin, 2010). There was not a statistically significant correlations between an institution's total revenue and expenditures and performance-based funding, after applying fixed variables (Kelchen & Stedrak, 2016). Institutions who received performance-based funding spent more money in unfunded grant aid and received less Pell Grant revenue per full-time

equivalent student compared to states that did not receive performance funding (Kelchen & Stedrak, 2016).

Summary

As outlined in this literature review, performance-based funding was initially implemented in 1979, with Tennessee becoming the first state where policymakers implemented funding based on the completion of outcomes (Callahan et al., 2017; Dougherty & Reedy, 2013; Gándara, 2020, January 12; Hayes, 2017; Kelderman, 2019; Mayes, 1995; Nisar, 2015). As of 2020, Twenty-nine states' policymakers have implemented performance-based funding models to its state's colleges and universities (Rosinger et al., 2020). This funding strategy was adopted as a form of accountability for colleges and universities (Kelchen & Stedrak. 2016), although Gándara (2020, January 12) argued that these funding models have not been effective in increasing completion rates. As highlighted by Miller and Morphew (2017) and Gándara et al. (2017), many state policymakers are making decisions driven by financial support from prominent nonprofit organizations. These advocacy organizations, according to Gándara et al. (2017), are causing policy diffusion as state policymakers and states' colleges' leaders are adopting and using language that is commonly found in information pamphlets and communications associated with performance-based funding. Despite the spread of performance-based funding, many of these performance funding models have created unintended consequences for some colleges and universities (Gándara, 2020, January 12; McKinney & Hagedorn, 2015, March 24; McKinney & Hagedorn, 2017; Umbricht et al., 2017), including the admission of at-risk students that may affect the level of funding received for community colleges (McKinney & Hagedorn, 2017) and the disparity of

funding for some HBCUs (Owen & Elliot, 2017). Gándara (2020, January 12) explained that colleges and universities with implemented performance-based funding measures may admit students that have a higher chance of being successful and securing funding, reducing the likelihood of admitting economically disadvantaged students.

As the popularity of performance-based funding continues to grow, additional literature in this area will be necessary so that state policymakers can make informed decisions on how to adopt, revise, or discontinue performance-based funding models. Additional review of literature and the investigation of new literature is necessary for college and university leaders to understand the challenges of performance-based funding and how to adapt to the changing pressures from state policymakers.

CHAPTER III

Methods

Introduction

A research proposal is the plan and procedure that a researcher uses that involves the collection of data for the research investigation (Creswell, 2013). Included in Chapter III of this research investigation was the planned methods of this study. In this research investigation, I implemented a nonexperimental causal-comparative research design using recommendations from Creswell (2013) and Creswell and Creswell (2018) to examine any effects that the independent variables (i.e., student demographics and performance-based funding measures) had on the dependent variable (i.e., success points). As previously mentioned, Texas lawmakers implemented performance-based funding and developed success points as a metric to evaluate and award community colleges for student performance.

All student success data are reported by individual colleges or college districts or systems and reported into the sole accountability system for the State of Texas, the Texas Higher Education Coordinating Board Accountability System. To better explore any statistically significant relationships between student success points and state implemented student or institutional outcome measures, I implemented a quantitative research investigation and included archival data from the information available on the Texas Higher Education Accountability System. Moreover, because the implementation of the policy of success point metrics are consistent statewide in Texas for all community colleges, it was necessary to extend the sampling size to every reporting community college in Texas to obtain robust statistics and sufficient sample size to calculate any

statistically significant correlations. Because student success points are disseminated to all Texas community colleges, I decided not to limit my sample by region or location within the state. However, future studies of aggregate data could include these variables as points of interest.

Moreover, because the main research problem in this investigation was the perceived imbalances, inequities, or consequences between state-implemented performance measures and student demographics and success points generated at Texas community colleges it was necessary to include all 50 community college or systems. The methods of this research investigation helped address any of these imbalances or inconsistencies by determining to what extent there were statistically significant correlations between success points and the performance of individual outcome measures and student demographics. Likewise, the components of this methodology were structured and selected in a way that would best address the problem of perceived imbalances, inequities, or consequences between state-implemented performance measures and student demographics and success points generated at Texas community colleges.

Purpose

The main purpose of this research investigation was to describe the steps and actions taken in the investigation of the research problem of the investigation (Kallett, 2004). As previously mentioned, the research problem in this research investigation was the perceived imbalances, inconsistencies, or consequences between student success points and the performance of individual outcome measures and student demographics. Moreover, provided in these Methods are the techniques utilized in the selection of data

(e.g., sampling, sampling frame, etc.), implementation of procedures, and various data analytical techniques used to evaluate these data to assist the reader in understanding the validity and reliability of the study (Kallett, 2004).

Research Questions

In developing the research questions for this investigative study, I sought to inquire about the relationships between and among various variables (Creswell, 2009). The methodology of this research investigation was guided by seven research questions, as previously discussed. These research questions were used to help develop several variables of this research study (e.g., participants, instruments, population, sampling frame, etc. The four research questions are as follows:

(a) What, if any, statistically significant relationship was present between the combination of students enrolled by demographic (i.e., Asian, Black, Hispanic, International, White, and students of other ethnicities), in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (b) What, if any, statistically significant relationship was present between the number of Asian students, Black students, Hispanic students, International Students, White students, and students of other ethnicities enrolled in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (c) What, if any, statistically significant relationship was present between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; and (d) What, if any,

statistically significant relationship was present between the student time to completion (i.e., years to receive degree or certificate) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?

Null and Alternate Hypotheses

Hypotheses are used by researchers as an experiment to compare certain groups (Creswell, 2009). Hypotheses are generated by the researcher or scientist after conceptualization of the problems (Hoy & Adams, 2016). Moreover, the development of hypotheses is an attempt to development insight to the state problems, in addition to reflection, observation, or "implicit or explicit theory" (Hoy & Adams, 2016, p. 7). I sought to predict various relationships between multiple variables in the creation of the hypotheses (Creswell, 2009).

The null hypotheses is a traditional approach when used by researchers that is predictive of no statistically significant relationships between two multiple variables. (Creswell, 2009). In this research study I employed various statistical procedures in order to draw inferences between outcome measures and student demographics to success points generated by Texas community colleges. In this research study, the null hypotheses (e.g., the unexpected outcome) indicated that there was no statistically significant relationship between the independent variables (i.e., outcome measures and student demographics) to the dependent variables (i.e., student success points).

The following null hypotheses were established for this research investigation: (a) there was no statistically significant relationship between the combination of students enrolled by demographic (i.e., Asian, Black, Hispanic, International, White, and students

of other ethnicities) in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (b) there was no statistically significant relationship between the number of Asian students, Black students, Hispanic students, International Students, White students, and students of other ethnicities enrolled in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (c) there was no statistically significant relationship between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; and (d) there was no statistically significant relationship between the student time to completion (i.e., years to receive degree or certificate) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years. The rejection of the previously mentioned null hypotheses would indicate that there were indeed statistically significant relationships between the independent and dependent variables.

Contrary to the null hypotheses, in this research investigation, I hypothesized a statistically significant relationship between outcome measures and student demographics and student success points. This expected outcome is known as the alternate hypothesis, as these alternate hypotheses were made on prior literature and studies that indicate correlations between outcome measures and student success point generation (Creswell, 2009). The alternate hypotheses were outlined as follows: (a) there was a statistically significant relationship between the combination of students enrolled by demographic

(i.e., Asian, Black, Hispanic, International, White, and students of other ethnicities)in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (b) there was a statistically significant relationship between the number of Asian students, Black students, Hispanic students, International students, White students, and students of other ethnicities enrolled in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?;(c) there was a statistically significant relationship between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; and (d) there was a statistically significant relationship between the student time to completion (i.e., years to receive degree or certificate) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years.

In this research investigation I created alternate hypotheses to make predictions based on what I believed to be true in regard to the correlation between the independent and dependent variables. In this study, four different groups of alternate and null hypotheses were created in order to address predictions between the independent and dependent variables as outlined in the research questions. The entire population of the study was utilized (i.e., State of Texas community colleges) in order to draw inferences in this research investigation.

Research Design

A non-experimental quantitative causal-comparative research design was created to identify any existing relationships between both the independent and independent variables based on a recurring action (Salkind, 2010). This research investigation was also developed quantitatively to examine variable relationships [e.g., relationship between independent variables and dependent variable] (Creswell, 2009). This research design was developed *ex post facto* (i.e., the design was developed after the interaction between the independent and dependent variables). A causal-comparative research design (Creswell & Creswell, 2018) was used to determine whether there were any statistically significant relationships between the independent variables (i.e., student success outcome measures and student demographics) and the dependent variable (i.e., student success points). Because data were archival, any differences in the number of success points generated at Texas community colleges were pre-existing. External variables (e.g., college-level initiative, cultural factors that may contribute to differences) that may have contributed to the number of success points generations and the outcome measures achieved were not accounted for in the research design of this investigation.

Moreover, in this research study, the use of a causal comparative research design enabled me to evaluate and determine any statistically significant relationships between the dependent variables (i.e., success points) and the independent variables (i.e., outcome measures and student demographic information). I was able to determine through the use of regression analysis whether specific outcome measures and student demographics affect the number of success points generated during a specific timeframe. Through *ex po*

facto research, I was able to evaluate preexisting data and results in this causal comparative research design.

Selection of Participants

Due to the quantitative nature of this research investigation, the selection of participants derived from existing, archival data, available from the Texas Higher Education Coordinating Board, which is the governing agency for Texas higher education. To accurately account for any statewide statistically significant correlations between student success points and student outcome measures and student demographics for Texas community colleges, all community colleges districts or systems located in Texas were selected as participants. Moreover, the selection of participants was determined by the participants' relevance to the research questions proposed in this study. For example, since only community colleges have implemented performance-based funding strategies, any other institutional types (e.g., universities) were eliminated from the study.

Texas consists of six major regions which includes 50 separate community college districts or systems (TACC, n.d.). Because Texas is a large state with community colleges spread throughout various regions, all Texas community colleges were included as participants to account for any variability outcomes in student success and differences in study demographics, that may have been associated with regional location of community colleges. Moreover, the selection of all Texas community colleges were necessary to capture the diversity of student demographics in examining any statistically significant correlations between success point generation and student demographics.

Participants

Participants were all Texas community colleges or districts that received state funding and reported student success points for the 2017-2019 academic years. Data were evaluated at an institutional level of all reporting community colleges in the State of Texas. Moreover, institutions that belong to a larger district or system were counted as a single participant as this is how data were reported. Standalone community colleges (i.e., community colleges not associated with a system) were counted as a separate participant. All Texas community college students who entered college and earned success points during the 2017-2019 academic years were included in this research study. As previously mentioned, a total of 50 Texas community colleges provided data that were analyzed herein. Colleges that were connected to a larger district or system were reported by that district or system, rather than by individual college.

Population

The population refers to all the elements that are obtained in a set (Hoy & Adams, 2016). The population of this research study included all Texas public institutions of higher education in the State of Texas. The population including 37 universities, 50 community college systems, 10 health-related institutions, six technical colleges, and three state colleges.

As previously mentioned, as reported by the Texas Association of Community Colleges, there are six major regions of community colleges in the State of Texas. These regions consist of colleges located in the Central, East, North, South, Southeast, and West regions of the state. Moreover, TACC (2019) also separates colleges by size, consisting of small, medium, large, and very large colleges. As reported in the Fall 2019 semester,

the unduplicated headcount enrollment for all Texas community colleges and systems was 717,314, representing a 4.7% aggregate increase across all reporting community colleges from the 2017 to 2019 fiscal year. Small college enrollment was 22,640 students, down 1.4% from 2017 and very large enrollment was 471,405, up 6.3% from 2017 (TACC, 2019). Enrollment increased in every size sector between the 2018 fall semester and 2019 fall semester except for small colleges. For this research investigation, these data represents participants used for the accumulation of success points for all reporting Texas community colleges.

Sample

As previously mentioned, because I elected to use data specifically related to performance-based funding and student success points, I narrowed my sample population to only community colleges because community colleges are the only public institution type in Texas that are funded based on performance and receives student success points. As such, data from all 50 Texas community colleges were utilized in this study.

Sampling Frame and Sampling Criteria

The sampling design in this research study was a single-frame design as I already had access to key variables (Creswell, 2009), through the Texas Higher Education Coordinating Board Accountability System. Moreover, nonprobability convenience sampling was conducted, as the data were already available through the Texas' state reporting system (Creswell, 2009). A stratification process was implemented in the selection of certain variables (e.g., student demographics and student outcome measures) to ensure proper representation of samples (Fowler, 2002).

As previously mentioned, all participants (e.g., community colleges) in this research study received success points for the 2017, 2018, and 2019 academic years. These academic years were used because these are the most recent academic years success points were recorded in the Texas Higher Education Accountability System at the time of this research investigation. All community colleges that received success points were utilized in this study to ensure accuracy of state totals. Leaving out any portion of this sample would have caused differences in data as well as differences in any data in determining any statistical significance.

Instrumentation and Procedures

Texas Higher Education Coordinating Board Interactive Accountability System database was used to retrieve these archival data. The Texas Higher Education Accountability System was created by the THECB upon mandate of Governor Rick Perry to require the coordinating board and higher education institutions to work collaboratively on providing the necessary information to determine institutional effectiveness and educational quality of students (THECB, n.d.). As a result, the Texas Higher Education Accountability System was created and consists of data from 38 public universities in Texas, all two-year community colleges and Texas and various Texas State Technical Colleges and Lamar State Colleges (THECB, n.d.). Moreover, one of the four essential components of the state's reporting system consists of key accountability measures: (a) participation, (b) success, (c) excellence, (d) research, and (e) institutional effectiveness (THECB, n.d.). As such, the Texas Higher Education Interactive Accountability System was used for the selection of participants in this research investigation.

Student success points from the 2017-2019 academic years were acquired from the Texas Higher Education Coordinating Board Interactive Accountability System from all Texas public community colleges and downloaded to a Microsoft™ Excel file. These academic years were selected because the 2017-2019 academic years represents the latest data available in the Texas state reporting system. Student success points are defined as a form of performance-based funding, which represents 10% of the overall state funding for Texas community colleges. (McKinney & Hagedorn, 2017). Student success points are reported and funded separately by specific outcome measure (TACC, 2019). Success points are continuous scaled ratio variables that have a starting point of 0 (Field, 2018) and are accumulated based on the achievement of the categorial independent variables of outcome measures. These outcome measures are nominal in nature, as there are more than two categories (Field, 2018) and student success is categorized by the achievement of these multiple outcomes. Because of this reporting structure, all the outcome measures as previously indicated in the research question portion of this investigation were used.

After data were downloaded to a Microsoft™ Excel file, the data were converted to the Statistical Package for the Social Sciences™ format, which allowed the use of statistical procedures and analyses of the data. These statistical procedures allowed the determination of any statistically significant differences in statewide student success point generation and the previously mentioned independent variables of outcome measures and student demographics. Although this study contained data related to success point generation as a result of student performance, these data did not include external variables that may affect success points for each of these subjects and community colleges.

Data Analysis

In this research study I followed the six steps of data analysis and interpretation outlined by Creswell (2009) as much as this quantitative analysis would support. These steps included: (a) reporting on the number of participants in the study and building a table to describe these members (e.g., community colleges systems); (b) discussion of how response bias might have affected the data analysis [e.g., participants or colleges not reporting student success points] (Fowler, 2002); (c) develop a plan to provide data through descriptive analysis of both the independent and dependent variables of the study; (d) describe statistical procedures for responding to any use of scaled instruments; (e) identify any statistical computer software or programming to test the hypotheses of the research student, and (f) presentation of the result in graphical representations. Descriptive statistics were reported in this research study to address the research question of how many students, by demographic, were enrolled in Texas community colleges in the 2017-2019 academic years.

Moreover, descriptive analyses were presented in this study to find the central tendency of the data (e.g., Mean, Median, Mode, and standard error) of the distribution of success points. Moreover, skewness and kurtosis levels are evaluated in order to find the distribution of scores or points (Field, 2018). In this research investigation I tested the skewness and kurtosis of the amount of success points generated by each independent variable (i.e., outcome measures). For this research investigation, I utilized acceptance levels as indicated by Field (2018). Skewness and kurtosis levels closes to 0 represent distribution that were more aligned with normal distribution, whereas as skewness and

kurtosis levels became further aware from 0, the less normally distributed the data became (Field, 2018).

Several assumptions were checked, including assumptions of independence of observations, linearity, homoscedasticity, and multicollinearity. Assumptions were checked to prepare the research analysis for both linear and standard multiple regression. Once assumptions were met, Pearson's correlation, linear regression, and standard multiple regression were conducted.

Moreover, to further check distribution and statistical significance, *z*-scores were used by dividing the skewness and kurtosis by the standard error. this research study I hypothesized a statistically significant relationships between multiple independent variables (i.e., demographics and certain outcome measures) that influenced the dependent variable (i.e., success points). When the dependent variables are influenced by multiple independent variables multivariate statistics should be utilized (Hoy & Adams, 2016).

To determine whether there were statistically significant relationships between each independent variable and dependent variable in addressing the research questions, the level of significance (i.e., alpha) was set to .05. In this research investigation, I sought to evaluate any existing relationships between the number of success points generated and the outcome measure and hypothesized a relationship between the two variables. Moreover, I hypothesized that the independent variables statistically significantly predicted the dependent variable and created changes in the dependent variable of success points. Because independent variables included both variables that were direct outcomes that generated success points and other variables that were not direct outcomes that

generated success points, correlations between the independent and dependent variables were unknown prior to conducting the study. Moreover, I sought to determine the type of relationships that existed between the independent variables (e.g., positive, negative, linear, or nonlinear). Although I hypothesized a statistically significant correlation, the strength and direction of the relationships was important to help inform policymakers in making decisions to either keep or alter which outcome measures are used in success point distribution.

A scatterplot was then developed for each independent and dependent variable combination to determine patterns of correlation between the variables and the type of correlation between variables. Moreover, after standardizing the data, which is necessary to overcome dependency on the measurement scale (Field, 2018), a Pearson's correlation coefficient was calculated for each set of variables as outlined in the research questions. In doing so, an *r* value was identified to better understand either the positive or negative correlation of each set of independent and dependent variables. Field (2018) noted that *r* values should fall between -1 (i.e., indicating a perfect negative correlation between the independent variable and dependent variable) and +1 (i.e., indicating a perfect positive correlation between the independent variable and dependent variable).

As identified by (Field, 2018), the following effect sizes were used from the correlation coefficient: (a) small effect size, + or – 0.1; (b) medium effect size, + or – 0.3; and (c) large effect size, + or - .05. For this research investigation, I used the correlation coefficient to test the hypotheses that there was a statistically significant correlation between the independent and dependent variables and that the correlation coefficient

would be different from 0. Finally, to test the statistical significance of the correlation, I used a confidence interval of 95%, or .05.

Linear regression analysis was conducted to determine which independent variables were identified as predictors of the independent variable of success points. Although ethnic groups were analyzed as a group in multiple regression analysis, linear regression allowed each variable to be measured separately. R^2 values were analyzed to determine the percentage of change the independent variable contributed to the change in the dependent variable of success point. Confidence interval was set at 95%, or .05 to determine statistical significance.

Finally, a combination of multiple regression models analyses were implemented to determine the change in the dependent variable of success points based on a combination of independent variables. Adjusted R^2 values were analyzed to determine the percentage of change that the combination of independent variables had to the change in the dependent variable of success points. Standardized weights were analyzed to determine the importance of the independent variable to the variance in differences to success points. Consistent with linear regression, confidence intervals were set at 95%, or .05 to determine statistical significance.

Summary

As previously mentioned, the main purpose of the methodology of this research investigation was to describe the steps and actions taken in the investigation of the research problem of the investigation (Kallett, 2004). Also as previously discussed, the research problem in this study was the perceived imbalances, inconsistencies, or consequences between student success points the performance of individual outcome

measures and student demographics. This methodology provided techniques used in the selection of data and implementation of procedures to analyze data, as discussed by Kallett (2004). The data analysis in this research investigation consisted of both descriptive statistics and correlational analysis of student success points generated and of all 50 community colleges in Texas. The Texas Higher Education Interactive Accountability System was used as the main instrument to extract data because this instrument is the primary state's reporting tool. Moreover, data from the 2017-2019 academic years were used because these are the latest years containing success point data. Data were analyzed from all 50 Texas community colleges to ensure accuracy of any statistically significant relationships between success points and performance measures.

In summary, provided in this Method are the techniques utilized in the selection of data, implementation of procedures, and various data analytical techniques used to evaluate these data to assist the reader in understanding the validity and reliability of the study (Kallett, 2004). As previously mentioned, I sought to examine any statistically significant relationships between various independent variables of outcome measures and the dependent variable of success points. Communicating the selection of data ensured that readers understood that the latest data available were used for this research investigation, which was unique to this research study from other existing research studies. The data analytical techniques included in this Method section ensured that the analysis was appropriate for the purpose of the research investigation, including addressing the research questions and testing the hypotheses.

CHAPTER IV

Results

Chapter IV contains the results of the analysis of this study. A linear regression analysis was conducted and several assumptions were tested in conducting this analysis. In addition to running a linear regression analysis, which indicated the level of predictiveness to the dependent variable by each independent variable for the combined years of 2017-2019, a multiple regression analysis was implemented to observe the effects of the combination of variables in multiple models from academic years 2017 to 2019. Prior to the reporting of results, several assumptions were tested, including impendence of observations, homoscedasticity, and normality of both linear regression and multiple regression analyses. The dependent variable of success points represented a continuous, scaled variable. The independent variables of this study were either nominal or continuous.

Assumption Checking

Assumptions were checked to ensure that both linear regression (i.e., sole independent variables) and multiple regression (i.e., various models and combination of variables) could proceed. Assumptions checked included independence of observation, linearity, homoscedasticity, and multicollinearity. All assumptions were generated prior to conducting linear or multiple regression analysis.

Independence of Observations

Before running regression analysis, variables were checked for independence of observation. As identified in Field (2018) the Durbin-Watson test was used in this analysis to test for correlation between residuals. For this analysis, measures as indicated

by Field (2018) were used to determine level of residual correlation. Durbin-Watson values below 1 or above 3 indicated residual correlation that should be observed and 2 represents no correlation between residuals (Field, 2018). Levels of residual correlation between the single independent variables and dependent variable of success points were within normal ranges: (a) certificates or degrees awarded, 1.977; (b) certificates or degrees awarded to economically disadvantaged students, 1.609; (c) time to certificate or degree; 2.141; (d) number of Black students enrolled, 1.923; (e) number of Hispanic students enrolled; 1.787; (f) number of Asian students enrolled, 1.869; (f) number of White students enrolled, 1.963; (g) number of International students enrolled, 2.081; (h) and number of students enrolled from other ethnicities, 1.812. Moreover, none of these Durbin-Watson levels were areas of concern in this study, as all were close to the level of 2, which indicated no correlation between residuals. Only two variables, time to certificate or degree and number of International students enrolled indicated a slight negative correlation between residuals and the independent variables indicated a positive correlation between adjacent residuals.

In addition to testing independence of observation for linear regression, Durbin-Watson levels were analyzed for the combination of all variables represented in the all research questions, revealing a level of 2.061 of all combined variables. Independence of adjacent residuals of ethnic group (i.e., all ethnicities combined) revealed a Durbin-Watson level of 2.356. Excluding ethnic group variables and analyzing certificates and degrees awarded, number of certificates or degrees awarded and time to certificate and degree revealed a Durbin-Watson level of 2.086. Certificate or degrees awarded and certificates or degrees awarded to students who were economically disadvantaged

produced a slightly positive adjacent residual correlation of 1.982. Certificates or degrees awarded and time to certificate or degree completion revealed a Durbin-Watson level of 2.077. Finally, the combination of certificates or degrees awarded to students who were economically disadvantaged and time to certificates or degrees produced a positive adjacent residual correlation of 1.703. All combinations of both linear regression and multiple linear regression models in testing for correlation of adjacent residuals revealed normal Durbin-Watson levels. These data had acceptable levels of autocorrelation of the residuals, which suggested that the analysis could proceed.

Linearity Testing

According to Field (2018), the outcome variables, which was success points in this research study, should have linear relationships with both predictors (i.e., each independent variable) and combined predictors (i.e., various independent variables). As can be seen in Appendix A, the scatterplot revealed a linear relationship between success points and all independent variables combined in the model. Analysis of variables independently produced a partial regression scatterplot which revealed a strong linear relationship between the dependent variable of success points and certificates or degrees awarded in all three years of analysis combined, as shown in Appendix B. As indicated in Appendix C, the partial regression scatterplot revealed a strong linear relationship between success points and time to certificate or degree completion, as a sole independent variable. Other variables and scatterplots outlining linearity between independent variables and the dependent variables of success points are delineated in Appendices C-H. These data represent a linear relationship between all independent variables and the dependent variable of success points, suggesting that the analysis could

proceed.

Homoscedasticity

Assumption of homoscedasticity was tested in order to check for consistent distribution of residuals. Predictor variables should have similar variance in order to be constant (Field, 2018). As can be seen in Appendix A, although there are separate clusters of residuals, the residuals are evenly spread as they move along predicted values. Different patterns that would have violated the measure of homoscedasticity would have been an increasing, decreasing, or fan-shaped funnel of residuals (Field, 2018). These patterns were not revealed, so the assumption of homoscedasticity was confirmed.

Multicollinearity

Multicollinearity was checked between variables to determine, which, if any independent variables were highly correlated with one another (Field, 2018). Perfect collinearity, when two predictor variables have a correlation of 1.0, invalidates regression coefficients due to the number of other coefficients that would work similarly in comparison (Field, 2018). Because multiple regression was implemented in this study, it was necessary to test for multicollinearity between different combinations and sets of variables, or different potential models of analysis.

Analysis of all combined variables revealed a substantial multicollinearity between independent variables, and produced high VIF levels (>7.0). The exception was time to certificate or degree that produced a VIF level of 1.297. Pearson's correlation tests revealed the following correlations between time to certificate or degree and other independent variables: (a) certificates or degrees awarded, .353; (b) number of certificates or degrees awarded to students who were economically disadvantaged, .358;

(c) number of Black students enrolled, .321; (d) number of Hispanic students enrolled, .359; (e) number of Asian students enrolled, .363; (f) number of White students enrolled, .377; (g) number of international students enrolled, .229; (h) and number students of other ethnicities enrolled, .295. Due to the high correlation of independent variables, further analyses were conducted to determine multicollinearity between different variables. Further observation of the model analysis, with all independent variables combined, revealed a very high correlation between certificates or degrees awarded and certificates or degrees awarded to students who were economically disadvantaged, .982.

Due to the high correlation between independent variables, these independent variables represented all research questions were then divided into two models to check for multicollinearity, ethnic groups and other independent variables (i.e., certificates or degrees awarded and time to certificate or degree completion). Due to the high level of multicollinearity with certificates or degrees awarded, certificates or degrees awarded to students who were economically disadvantaged was excluded from this model. The model analyzation of all ethnic groups revealed high VIF totals in all ethnic group except for number of Hispanic student enrolled (VIF = 2.461). This model indicated a high Pearson Correlation between Black students enrolled and Asian students enrolled, .958; and Black students and students of other ethnicities enrolled, .920. As such, the three ethnicities producing the highest enrollment totals were analyzed, producing results that were not multicollinear, Black student enrollment, VIF = 3.791; Hispanic student enrollment, VIF = 2.411; and White student enrollment, VIF = 3.309.

Certificates or degrees awarded and time to certificate or degree variables produced Pearson's correlation of .353, VIF=1.142. As predicted, including number of

certificates or degrees awarded to students who were economically disadvantaged revealed a high level of correlation between certificates or degrees awarded and certificates or degrees awarded to economically disadvantaged students, .982, VIF=28.388. However, time to certificate or degree completion produced non-multicollinear results for both certificates or degrees awarded, .353 and certificates or degrees awarded to economically disadvantaged students, .358.

Another model representing certificates or degrees awarded, time to certificate or degree completion, number of Black students, number of Hispanic students, and number of White students revealed a high level of multicollinearity between degrees awarded and number of Hispanic students enrolled, .965, VIF = 21.444. Adding certificates or degrees awarded to economically disadvantaged students produced slightly higher multicollinearity with the number of Hispanic students enrolled, .974, VIF = 21.746.

Although many of the variables as a combination revealed multicollinearity with one another, analysis revealed that the highest level of multicollinearity was between the independent variables of certificates or degrees awarded and certificates or degrees awarded to students who were economically disadvantaged, .982. Analysis also revealed a high level of correlation between certificates or degrees awarded to the number of Hispanic students enrolled, .965; the highest correlation of any ethnic group to certificates or degrees awarded. The number of International students enrolled had the lowest multicollinearity level of any ethnic group to degrees awarded, .662. As previously mentioned, time to completion did not produce a high level of collinearity with any other independent variable. Although there was some level of multicollinearity in this research study, the overall assumptions of met assumptions suggest that linear and

multiple regression analyses could proceed.

Descriptive Statistics

Located in Tables 4-8 are the descriptive statistics for the analysis of this study. These descriptive statistics included data that were analyzed between the dependent variable of student success points allocated to Texas community colleges for the achievement of student outcome metrics and the predictive independent variables of number of certificates or degrees awarded, numbers of certificates or degrees awarded to economically disadvantaged students, time to certificate or degree completion, and number of students by ethnicity (i.e., Asian, Black, International, Other, and White). Academic years 2017, 2018, and 2019 were used in this analysis, as these dates represent the most recent data that were available through the state's official reporting site at the time of research and data compilation. Community colleges where administrators reported data for all three years (n = 50) were used in this analysis. As delineated in Table 4 the mean number of success points in 2017 were 22,565.58 (SD=27,420.12) for all 50 participating community colleges. Moreover, Hispanic students represented the highest mean of any student ethnic group (M = 10,956.14), followed by White students (M = 9,121.70), and Black students (M = 3,932.70). International students represented the lowest mean in 2017 of any student ethnic group (M = 694.62). Only half as many students who were economically disadvantaged earned degrees than students who were not economically disadvantaged in 2017. The average number of years to completion (i.e., degree or certificate completion) in 2017 was 3.92 years.

Table 4

Descriptive Statistics for Dependent and Independent Variables of all Texas Community Colleges in 2017

Variable	*n* of reporting community colleges	*M*	*SD*
Success Points	50	22,565.58	2,741.12
Certificates or Degrees Awarded	50	3,491.16	4,449.27
Certificates or Degrees Awarded to ED Students	50	1,166.04	,1436.19
Time to Degree	50	3.92	.551
Black Students Enrolled	50	3,932.70	8,077.67
Hispanic Students Enrolled	50	10,956.14	16,347.73
Asian Student Enrolled	50	1,374.46	2,974.69
White Students Enrolled	50	9,121.70	11,636.72
International Students Enrolled	50	694.62	2,292.94
Other Students Enrolled	50	1,385.26	2,609.37

Note. n = all Texas community colleges or community college systems receiving success points; ED = economically disadvantaged.

In 2018, the mean number of success points were 23,161.76 (*SD* = 28,154.33), representing a slight increase from 2017. Consistent with 2017 data, Hispanic students represented the highest mean of any student ethnic group (*M* = 10,846.74), although this average was a slight decrease from 2017. White students followed (*M* = 8874.00), followed by Black students (*M* = 3881.64). International students represented the lowest

mean in 2017 for any student ethnic group (M = 712.06), although this statistic represented an increase from 2017. Consistent with 2017 data, less than half as many students who were economically disadvantaged earned certificates or degrees than students who were not economically disadvantaged in 2018. The average number of years to certificate or degree decreased from 3.92 years in 2017 to 3.81 years in 2018.

Table 5

Descriptive Statistics for Dependent and Independent Variables of all Texas Community Colleges in 2018

Variable	*n* of reporting community colleges	*M*	*SD*
Success Points	50	2,3161.76	2,8154.33
Certificates or Degrees Awarded	50	3,751.30	4,746.03
Certificate or Degrees Awarded to ED Students	50	1,154.94	1,393.59
Time to Certificate or Degree	50	3.81	.529
Black Students Enrolled	50	3,881.64	7,976.52
Hispanic Students Enrolled	50	10,846.74	16,778.15
Asian Student Enrolled	50	1,386.16	2,994.82
White Students Enrolled	50	8,774.00	11,119.26
International Students Enrolled	50	712.62	2,506.51
Other Students Enrolled	50	1,288.46	2,307.78

Note. n = all Texas community colleges or community college systems receiving success points; ED = economically disadvantaged.

In the final year of analysis, 2019, as presented in Table 6, the mean number of success points were 23,751.18 (*SD* = 29,913.26), representing an increase from both previous years, 2017 and 2018. Consistent with both 2017 and 2018 data, Hispanic students represented the highest mean of any student ethnic group (*M* = 11,150.96). The next highest mean were White student enrollment (*M* = 8477.52), followed by Black student enrollment (*M* = 3781.42). Although Black student enrollment represented the third highest mean of all ethnic groups in all years of analysis, this ethnic group mean also decreased in each of the three years of study. Consistent with 2017 and 2018 data, International students represented the lowest mean in 2019 of any student ethnic group (*M* = 670.07). This statistic also represented an enrollment decrease from 2018. Consistent with 2017 and 2018, less than half as many students who were economically disadvantaged earned certificates or degrees than students who were not economically disadvantaged in 2019. The gap between certificates or degrees awarded and certificates or degrees awarded to students who were economically disadvantaged during the respective time periods increased each year. The average number of years to certificate or degree decreased from 3.81 years in 2018 to 3.72 years in 2019. Time to certificate or degree completion, represented by years, decreased all three years.

Table 6

Descriptive Statistics for Dependent and Independent Variables of all Texas Community Colleges in 2019

Variable	*n* of reporting community colleges	*M*	*SD*
Success Points	50	23,751.18	28,913.26
Certificates or Degrees Awarded	50	3,815.68	4,786.05
Certificate or Degrees Awarded to ED Students	50	1,156.72	1,378.58
Time to Certificate or Degrees	50	3.72	.516
Black Students Enrolled	50	3,781.42	7,681.53
Hispanic Students Enrolled	50	11,150.96	17,044.30
Asian Student Enrolled	50	1,400.24	3,010.01
White Students Enrolled	50	8,477.52	10,604.08
International Students Enrolled	50	670.07	2,468.14
Other Students Enrolled	50	1,289.16	2,182.53

Note. n = all Texas community colleges or community college systems receiving success points; ED = economically disadvantaged.

As delineated in Table 7, descriptive statistic were also analyzed evaluating all data from academic years 2017 to 2019. Combining all three years, the mean number of success points were 23,159.50 (*SD* = 27,980.47). The maximum number of success points received by any community college or community college system within any year of the three-year analysis was 118,287.00. The minimum number of success points

received by any community college or community college system within any year of the three year analysis was 2,575.00. Consistent with prior years' data that represented that Hispanic student enrollment represented the highest mean, this ethnic group category also represented the highest enrollment of any community college or community college system for any given year in the 3-year analysis, 68,048.00, followed by White students, 49,076.00, and Black students, 40,0053.00. International students were the only ethnic group to not have any enrollment for at least one community college or community college system during a single period of analysis. The maximum number of certificates or degrees awarded to students who were economically disadvantaged compared to students who were not economically disadvantaged were just over 30%. The average time to certificate or degree between 2017 and 2019 was 5.40 years.

Table 7

Descriptive Statistics for Dependent and Independent Variables of all Texas Community Colleges from 2017 to 2019.

Variable	*n* of reporting community colleges	*M*	*SD*	Minimum	Maximum
Success Points	150	23,159.50	27,980.47	2,575.00	118,287.00
Certificates or Degrees Awarded	150	3,686.04	4,633.65	108.00	20,905.00
Certificate or Degrees Awarded to ED Students	150	1,159.23	1,393.56	39.00	6,626.00
Time to Certificate or Degree	150	3.822	.535	2.20	5.40
Black Students Enrolled	150	3,865.25	7,860.65	14.00	40,053.00
Hispanic Students Enrolled	150	10,864.61	16,614.78	84.00	68,049.00
Asian Student Enrolled	150	1,386.95	2,973.07	7.00	13,394.00
White Students Enrolled	150	8,791.07	11,056.18	223.00	49,076.00
International Students Enrolled	150	692.44	2,408.05	0.00	15,975.00
Other Students Enrolled	150	1,320.96	2,357.79	45.00	15,109.00

Note. n = all Texas community colleges or community college systems receiving success points between 2017 and 2019, each community college counted once per year; ED = economically disadvantaged.

As indicated in Table 8, the skewness and kurtosis coefficients for each variable were examined for all three years combined to determine both symmetry and distribution of success points and the independent variables. The analysis for the dependent variable of success points revealed a high level of skewness and kurtosis, indicating a high variability in symmetry and distribution across participating institutions. Although a majority of the data were not symmetrical or normally distributed, this could be due to the variability of institution size which contributed to the variance in distributed success points and will be discussed in Chapter 5. Similarly, skewness and kurtosis were examined for the independent variables for 2017, 2018, and 2019. Results primarily revealed large departures from the normal distribution. The exception was the independent variable of time to certificate or degree completion.

Table 8

Descriptive Statistics for Independent Variables for all Texas Community Colleges between 2017 and 2019 with Skewness and Kurtosis

Independent Variable	N	Mean	Std. Deviation	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
Ethnicity – Black	150	3,932.70	8,077.67	3.190	.337	10.159	.662
Ethnicity – Hispanic	150	10,596.14	10,596.14	2.105	.337	3.576	.662
Ethnicity – Asian	150	1,374.46	2,974.69	2.743	.337	6.984	.662
Ethnicity – White	150	9,121.70	11,636.72	2.321	.337	4.863	.662
Ethnicity – International	150	694.62	2,292.96	4.846	.337	24.733	.662
Ethnicity – Other	150	1,385.26	2,609.37	3.810	.337	16.580	.662
Certificates or Degrees Awarded	50	3,491.16	4,449.27	2.049	.337	3.497	.662
Certificates or Degrees Awarded - ED	150	1,166.04	1,436.19	2.200	.337	4.462	.662
Time to Certificate or Degree	150	3.92	.552	.304	-.370	1.352	.662

(continued)

Note. n = all Texas community colleges or community college systems receiving success points between 2017 and 2019, each community college counted once per year; ED = economically disadvantaged.

Pearson's Correlation

Pearson's Correlation was conducted to examine the strength and direction of the relationship between each independent variable and the dependent variable of success points. Strength of association sizes were determined by using Cohen (1988) levels of the coefficient values. The analysis revealed a strong statistically significant positive correlation between certificate or degrees awarded and success points between the 2017 and 2019 academic years, $r(148) = .966$, $p < .001$. Certificated or degrees awarded alone explained 93.3% of variance of success points. Certificates or degrees awarded to students who were economically disadvantaged students and success points between the 2017 and 2019 academic years produced a strong statistically significant positive correlation, $r(148) = .948$, $p < .001$. Certificates or degrees awarded to economically disadvantaged students explained 89.8% the variance of success points. A moderately strong positive statistically significant correlation existed between time to certificate or degree completion and success points between the 2017 and 2019 academic years, $r(148) = .404$, $p < .001$. Time to certificate or degree explained 15.8% of the variance of success points.

The number of Black students enrolled explained 73.2% of the variance of success points, producing a strongly correlated and statistically significant positive relationship with success points between the 2017 and 2019 academic years, $r(148) = .856$, $p < .001$. Likewise, the number of Hispanic students enrolled revealed a strongly

positively correlated relationship with success points, $r(148) = .933$, $p < .001$; accounting for 87.0% of the variance of success points during this same time period. White student enrollment accounted for 76.4% of the variance of success points and analysis revealed a strong positive correlation with success points, $r(148) = .875$, $p < .001$. The analysis revealed a strong statistically significant positive correlation between Asian student enrollment and success points, $r(148) = .888$, $p < .001$. Asian student enrollment alone explained 78.8% of variance of success points. Analysis of International student enrollment explained a strong and positive correlation with success points, $r(148) = .663$, $p < .001$. International student enrollment along explained 43.6% of the variance of success points. Students who identified as any other ethnicity group explained 71.4% of the variance of success points, $r(148) = .846$, $p < .001$. As will be discussed in the regression reporting, all independent variables combined explained 98.5% of the variance of success points.

Linear Regression

Linear regression analysis was implemented to determined which, if any, independent variables could be identified as a predictor of success points. Each independent variable was analyzed independent of other independent variables to determine the certificate or degree of prediction from each independent variable to the dependent variable of success points. Ethnic groups were evaluated both independently and combined as a group to determine linear relationship with success points.

Non Ethnic Group Independent Variable Analysis

Linear regression analysis indicated that certificates or degrees awarded statically significantly predicted success points, $F(1, 148) = 2070.937$, $p = < .001$. Certificates or

degrees awarded explained 93.3% of the variability of success points. Certificates or degrees awarded to economically disadvantaged students explained 89.8% of the variability of success points and produced statistically significant results, $F(1, 148) = 1318.252$, $p = < .001$. Time to certificate or degree as a sole independent variable was a statistically significant predictor of success points, $F(1, 148) = 28.876$, $p = < .001$, and accounted for 15.8% of the explained variability of success points.

Ethnic Group Independent Variable Analysis

All ethnic group variables when treated independently statistically significantly predicted success points: (a) number of Black students enrolled, $F(1, 148) = 407.292$, $p = < .001$, $R^2 = .732$; (b) number of Hispanic students enrolled, $F(1, 148) = 995.172$, $p = < .001$, $R^2 = .870$; (c) number of Asian students enrolled, $F(1, 148) = 553.282$, $p = < .001$, $R^2 = .788$; (d) number of White students enrolled, $F(1, 148) = 484.069$, $p = < .001$, $R^2 = .764$; (e) number of International students enrolled, $F(1, 148) = 116.310$, $p = < .001$, $R^2 = .436$; and (f) number of students who identified as Other ethnic group enrolled, $F(1, 148) = 373.509$, $p = < .001$, $R^2 = .714$. In addition to analyzing ethnic groups independently, all ethnic groups combined as independent variables statistically significantly predicted the dependent variable of success points; $F(6, 143) = 1063.535$, $p = < .001$. Together these variables account for 97.7% of the variance in success points.

Standard Multiple Regression

After conducting linear regression analysis, multiple regression analysis was implemented to determined which, if any, independent variables could be identified as a predictor of success points. Coefficients were also examined to determine any outcome

change in the dependent variable by changes in the independent variable, as described by Field (2018).

Model 1

Model 1 represents changes to the dependent variable of success points from 2017-2019, combining all independent variables of certificates or degrees awarded, certificates or degrees awarded to students who were economically disadvantaged, time to certificate or degree completion, and number of students enrolled by ethnic group. The combination of these independent variables statistically significantly explained differences in success points; $F(9,140) = 1126.060$, $p < .001$, $R^2 = .986$. Delineated in Table 9 are the regression coefficients and standard errors for Model 1.

Table 9

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	SS	df	F	*p*	*R*	R^2
	Regression	115063607528.67	9	1,126.06	.000	.993	.986
Model 1	Residual	1589505455	140				
	Total	116653112983	149				

Note. Model 1 = certificates or degrees awarded, certificates or degrees awarded to students who were economically disadvantaged, time to certificate or degree, and all ethnic groups.

Moreover, in this model, all independent variables, except for number of International students enrolled, number of certificates or degrees awarded to students who were economically disadvantaged, and time to certificate or degree, were statistically significant to the prediction of success points, $p < .05$. Multiple regression coefficient results for this model are indicated in Table 10. There was over 10,000 success points for every 4,633 degrees awarded when assessing standardized weights. In order of importance, Hispanic students, White students and Asian students contributed the most positive variance to success points. Black students and students of other ethnicities contributed negative variance to success points.

Table 10

Multiple Regression Coefficients Table for the Effects of Multiple Variables on Student Success Point Change

Variable	*B*	β	*p*	*R*	R^2
Constant	936.498		.671	.993	.986
Certificates or Degrees Awarded	2.197	.364	<.001	.966	.933
Black Students Enrolled	-.593	-.167	.006	.856	.733
Hispanic Students Enrolled	.366	.218	<.001	.933	.871
Asian Students Enrolled	4.133	.439	<.001	.888	.789
White Students Enrolled	.658	.260	<.001	.875	.766
International Students Enrolled	.397	.034	.398	.663	.440
Other Ethnicities Enrolled	-2.264	-.191	<.001	.846	.716
Certificates or Degrees awarded to ED	1.969	.098	.258	.948	.899
Time to Certificate or Degree	353.204	.007	.548	.404	.163

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination; ED = economically disadvantaged.

Model 2

Model 2 excludes all ethnic independent variables and includes only certificates or degrees awarded and time to certificate or degree. As mentioned previously due to the multicollinearity between certificates or degrees awarded and certificates or degrees awarded to economically disadvantaged students, the latter was excluded from this

model. The combination of both certificates or degrees awarded and time to certificate or degree completion statistically significant explained differences in success points; $F(2,147) = 1108.924$, $p < .001$, $R^2 = .938$. Delineated in Table 11 are the regression coefficients and standard errors for Model 2.

Table 11

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	SS	df	F	*p*	*R*	R^2
	Regression	109401902457	2	1,108.924	<.001	.968	.938
Model 2	Residual	7251210526	147				
	Total	116653112983	149				

Note. Model 2 = certificates or degrees awarded and time to degree

Both independent variables, certificates or degrees awarded and time to certificate or degree were statistically significant to the prediction of success points, $p < .05$. Multiple regression coefficient results for this model are indicated in Table 12.

Table 12

Multiple Regression Coefficients Table for the Effects of Multiple Variables on Student Success Point Change

Variable	B	β	*p*	*R*	R^2
Constant	-12,161.18		.005	.938	.938
Certificates or Degrees Awarded	5.680	.941	<.001	.966	.933
Time to Certificate or Degree	3762.810	.072	.001	.404	.163

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination.

Model 3 – All Ethnic Group Independent Variables

Included in Model 3 are all ethnic independent variables. The combination of all ethnic categories statistically significant explained differences in success points; $F(6,143) = 1063.535$, $p < .001$, $R^2 = .978$. Delineated in Table 13 are the regression coefficients and standard errors for Model 3.

Table 13

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	df	SS	F	*p*	*R*	R^2
	Regression	6	114096268532	1,063.535	<.001	.989	.978
Model	Residual	143	2556844451				
3	Total	149	1166533112983				

Note. Model 3 = all ethnic group independent variables combined

In Model 3, all independent variables were statistically significant to the prediction of success points, $p < .05$, except for number of International students enrolled ($p = .084$). Readers are directed to Table 14 for multiple regression coefficient results for Model 3.

Table 14

Multiple Regression Coefficients Table for the Effects of Ethnic Group Variables on Student Success Point Change

Variable	B	β	*p*	*R*	R^2
Constant	3,760.768		<.001	.989	.978
Black Students Enrolled	-.461	-.129	.030	.856	.733
Hispanic Students Enrolled	1.003	.596	<.001	.933	.871

(continued)

Variable	B	β	*p*	*R*	R^2
Asian Students Enrolled	4.043	.430	.<.001	.888	.789
White Students Enrolled	.925	.365	<.001	.875	.766
International Students Enrolled	.934	.080	.084	.663	.440
Other Ethnicities Enrolled	-3.109	-.262	<.001	.846	.716

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination.

Model 4

As previously indicated due to high correlations between Black students enrolled and Asian students enrolled, the ethnic groups producing the highest enrollments were analyzed, as these variables were not multicollinear. The combination Black students enrolled, Hispanic students enrolled, and White students enrolled statistically significantly explained differences in success points; $F(3,146) = 1389.958$, $p < .001$, $R^2 = .966$. Delineated in Table 15 are the regression coefficients and standard errors for Model 4.

Table 15

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	SS	df	F	*p*	*R*	R^2
	Regression	112706900803	3	1,389.958	<.001	.983	.966
Model	Residual	3946212180	146				
4	Total	116653112983	149				

Note. Model 4 = Black students enrolled, Hispanic students enrolled, and White students enrolled.

All independent variables in Model were statistically significant to the prediction of success points, $p < .001$. Indicated in Table 16 are multiple regression coefficient results for Model 4.

Table 16

Multiple Regression Coefficients Table for the Effects of Major Ethnic Group Variables on Student Success Point Change

Variable	B	β	*p*	*R*	R^2
Constant	2,806.292		<.001	.983	.966
Black Students Enrolled	.457	.128	<.001	.856	.733
Hispanic Students Enrolled	.988	.587	<.001	.933	.871
White Students Enrolled	.894	.587	<.001	.875	.766

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination.

Model 5

Due to the low level of multicollinearity between variables, Model 5 consisted of the independent variables of certificates or degrees awarded, time to certificate or degree, and number of Black students enrolled. Independent variables identified in Model 5statistically significantly explained variations in success points; $F(3,146) = 1011.807$, $p < .001$, $R^2 = .954$. Delineated in Table 17 are the regression coefficients and standard errors for Model 5.

Table 17

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	SS	df	F	*p*	*R*	R^2
	Regression	111299732751	3	1,011.807	<.001	.977	.954
Model	Residual	5353380232	146				
5	Total	116653112983	149				

Note. Model 5 = certificates or degrees awarded, Black students enrolled, and time to degree.

All independent variables in Model were statistically significant to the prediction of success points, $p < .05$. Indicated in Table 18 are multiple regression coefficient results for Model 5.

Table 18

Multiple Regression Coefficients Table for the Effects of Multiple Variables on Student Success Point Change

Variable	B	β	*p*	*R*	R^2
Constant	-9,506.585		.011	.977	.954
Certificates or Degrees Awarded	4.650	.770	<.001	.966	.933
Black Students Enrolled	.768	.216	<.001	.856	.733
Time to Certificate or Degree	3,285.310	.063	.001	.404	.163

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination.

Model 6

Model 6 represents all possible independent variables that were not highly multicollinear. These independent variables included certificates or degrees awarded, time to certificate or degree completion, number of Black student enrolled and number of White students enrolled. The combination of these independent variables statistically significantly explained differences in success points; $F(4,145) = 1309.249$, $p < .001$, $R^2 = .973$. Shown in Table 19 are the regression coefficients and standard errors for Model 6.

Table 19

Regression Model Summary for Dependent Variable and Independent Variables

Model	Source	SS	df	F	*p*	*R*	R^2
	Regression	113510281986	4	1309.249	<.001	.986	.973
Model	Residual	3142830997	145				
6	Total	116653112983	149				

Note. Model 6 = certificates or degrees awarded, Black students enrolled, time to certificate or degree, and White students enrolled.

All independent variables in Model were statistically significant to the prediction of success points, $p < .05$. Indicated in Table 20 are multiple regression coefficient results for Model 6.

Table 20

Multiple Regression Coefficients Table for the Effects of Multiple Variables on Student Success Point Change

Variable	B	β	*p*	*R*	R^2
Constant	-6,711.719		.021	.986	.973
Certificates or Degrees Awarded	4.155	.688	<.001	.966	.933
Black Students Enrolled	.263	.074	.007	.856	.733
Time to Certificate or Degree	2016.075	.039	.010	.404	.163
White Students Enrolled	.664	.253	<.001	.875	.766

Note. B = unstandardized regression coefficient; β = standardized coefficient; R^2 = coefficient of determination.

Summary

Results indicated that all independent variables treated separately, contributed to the dependent variable of success points. Certificates or degrees awarded, Black students enrolled, Hispanic students enrolled, Asian students enrolled, White students enrolled, students of Other ethnicities enrolled were all statistically significant to the dependent variable of success points. Treated separately, International students enrolled, certificates or degrees awarded to students who were economically disadvantaged, and time to certificate or degree completion were not statistically significant. Multiple regression analysis revealed that although some variables were highly correlated with one another (i.e., certificates or degrees awarded and certificates or degrees awarded to students who were economically disadvantaged), several regression models were consistent with multiple variables statistically significantly contributing to changes in the success points. Moreover, as previously mentioned, independent variables were categorized into models based on prior assumption and to ensure lower levels of multicollinearity. Excluding Model 1 and Model 3, which included all grouped independent variables, these models included: (a) Model 2, only certificates or degrees awarded and time to degree; Model 4, the combination Black students enrolled, Hispanic students enrolled, and White students enrolled; Model 5, certificates or degrees awarded, time to certificate or degree, and number of Black students enrolled; and Model 6, certificates or degrees awarded, time to certificate or degree completion, number of Black student enrolled and number of White students enrolled.

Unstandardized weights in Model 1, which included all independent variables, revealed that certificates or degrees awarded, certificates or degree awarded to students

who were economically disadvantaged, Asian students, Hispanic students, White students, and International students revealed positive variances to the changes in success points. Asian students revealed the most positive change to success points at just over four success points for every student enrolled. Unstandardized weights revealed that Black students and students of other ethnicities contributed a negative variance to success points for every student enrolled.

Calculating standardized weights revealed that certificates and degree awarded mattered most to the variance to success points, contributing just over 10,000 success points for every 4,633 degrees awarded. In order of importance to the regression model weights, ethnic group variables of Hispanic students, White students and Asian students contributed the most positive variance to success points. Consistent with unstandardized weights, standardized weights revealed that Black students and students of other ethnicities contributed negative variance to success points. For every approximate 7,860 Black students enrolled, there was a decrease in approximately 1,312 success points. For every approximate 2,357 students of other ethnicities enrolled, there was a decrease in approximately 450 success points. Time to degree completion was not statistically significant and standardized weights revealed nominal changes to success points.

These multiple models in this analysis were important in order to ensure various combination of effects on the dependent variable of success points by the independent variables.

CHAPTER V

Discussion

Included in Chapter V of this research study are discussion of major findings, implications of findings, and recommendations for state lawmakers, community college leaders, and researchers that were discovered during the review of the quantitative results of this study. Specifically, this discussion was focused on the effects of Texas community college performance-based funding on the achievement of state implemented outcome measures, as outlined in the research questions. As previously mentioned, a linear regression analysis and multiple regression analysis was conducted and several assumptions were measured in conducting this analysis. In addition to performing a linear regression analysis, which indicated the level of predictiveness to the dependent variable by each independent variable for the combined years of 2017-2019, a multiple regression analysis was conducted to determine results and findings from the combination of multiple independent variables. Addressed in this discussion are the major findings, implications, and recommendations to state policymakers, community college leaders, and researcher as they relate to the following research questions: (a) What, if any, statistically significant relationship was present between the combination of students enrolled by demographic (i.e., Asian, Black, Hispanic, International, White, and students of other ethnicities), in Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (b) What, if any, statistically significant relationship was present between the number of Asian students, Black students, Hispanic students, International Students, White students, and students of other ethnicities enrolled in Texas community

colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; (c) What, if any, statistically significant relationship was present between the number of students who received a certificate or degree at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?; and (d) What, if any, statistically significant relationship was present between the student time to completion (i.e., years to receive certificate or degree) at Texas community colleges in the 2017-2019 academic years and the number of success points generated at Texas community colleges in the 2017-2019 academic years?

As indicated in Chapter IV, all independent variables treated separately statistically significantly contributed to the dependent variable of success points. Moreover, multiple regression analysis revealed that there was a high correlation between some combination independent variables and the dependent variables of success points, although some variables were highly correlated with one another. Several regression model results were consistent with multiple variables statistically significantly contributing to variation in the success point distribution.

Summary of Research

As previously mentioned, community college leaders have increasingly become more reliant upon performance-based funding models, and as a result, this type of funding model has become a "driver for survival" (McKinney & Hagedorn, 2017, p. 21). Due to the implementation of these new performance-based funding models, Texas community colleges administrators and leaders may feel pressured to create admission policies and guidelines that would favor admission of certain student groups to ensure

adequate state funding (McKinney & Hagedorn, 2017). Regardless of population served, or internal institutional mission, community college leaders understand that the higher level of state implemented outcomes must be met to secure performance-based funding. Although at the time of this research investigation performance-based funding was only a fraction of overall state funding, increased attention to this funding type and potential policy diffusion increases the likelihood a shift towards a higher percentage of state funding be allocated based on performance. Moreover, the outcomes and indicators tied to institutional funding may limit the institutions' ability to recruit of low income and minority students. Further, as previously mentioned, McKinney and Hagedorn (2017) argued that state policymakers have done a poor job in the implementation of these performance-based funding models in recognizing diverse community college missions across the state, which include student characteristics. This research investigation was structured in a manner to provide research and data to address the problem addressed in this study, which are the perceived imbalances, inequities, or consequences between state-implemented performance measures and student demographics and success points generated at Texas community colleges. Further, statistically significant correlations or relationships between the previously identified independent variables and dependent variables of success points were identified in this study. Understanding these relationships and correlations will better help state policymakers, community college leaders, and researchers understand and address the perceived consequences between the performance metrics and the awarding of success points. It was hypothesized in this study that there were statistically significant relationships between the independent variables as outlined in the research questions and the dependent variable of success points. The

research supported these hypotheses, as all independent variables statistically significantly contributed to the variance in success points. This analysis was completed through a non-experimental causal-comparative research design to examine variable relationships [e.g., relationship between independent variables and dependent variable] (Creswell, 2009).

Theoretical Framework Related to Findings Revisited

The theoretical framework of this study, as previously mentioned, was the guiding framework of this research investigation and was based on the principal-agent theory, where the principal is the sanctioning authority over the agent, the entity that is required to meet the goals of the principal to receive rewards (Tandberg & Hillman, 2014). This is relevant to the findings, implications, and recommendations of this study due to the scope of authority that Texas state lawmakers have in implementing success points in community college performance-based funding. All public community colleges in Texas received performance-based funding as a result of the achievement of outcome measures implemented by state lawmakers. However, state lawmakers should understand the impact that this theory may have on the implementation of outcome measures and the completion of these outcomes from various community colleges. Moreover, findings of this study may be in part the product of the pressures applied to community college leaders as a result of the principal-agent theory. It was difficult to determine if results were based on intrinsic motivation of completing institutional missions or results from external pressures to funding and student success. In order to receive performance-based funding, community college decision makers may be forced to shift attention from previously crafted mission statements and objectives and move institutional focus

towards the completion of these outcomes, regardless if the completion of these outcomes are consistent with existing missions or strategic initiatives. This shifting of focus may come at the neglect of other variables or outcome measures that are not key or direct funding variables. State lawmakers must understand both the direct and indirect pressures being applied to community college leaders in relation to the principal-agent theory. Community college decision makers may be forced to make the decision of choosing funding over being true to existing missions, shifting institutional missions to be aligned with funding strategies.

Key Findings and Implications

Findings from the results of this research investigation were identified after conducting quantitative analysis, including correlational analysis, linear regression analysis, and multiple regression analysis of the dependent variable of success points and various independent variables as outlined in the research questions. As previously described, the purpose of this research investigation was to address the problem of perceived imbalances, inconsistencies, or consequences between student success points and the performance of individual outcome measures and student demographics. These findings outlined in this study have added to existing literature and findings regarding performance-based funding. These key findings have been compiled during a time of the continual changing landscape of Texas performance-based funding. As previously mentioned, THECB officials recommended changes to the weights of success points to take effective during the 2022-2023 biennium that include: (a) changing success points received for each student who transfers to a university from 2.0 points to 2.75 points; (b) lowering the number of success points received for each student who completes a degree

or certificate from a field that is not critical (e.g., STEM) from 2.0 points to 1.2 points; and (c) raising the number of success points received for each student who completes a degree or certificate in a critical field from 2.25 points to 3.0 points (THECB, 2019). As noted from these revised weights, less emphasis will be focused on degree completion and more focus will be on completion of degree from a STEM field. This is important to the findings of this research because the start of this research was conducted prior to the recommendations to change metric weights. Findings from this study may help inform state lawmakers if changes in these metrics are necessary or if attention should be shifted to other metrics. As such, as the landscape of performance-based funding continues to change, these findings may be useful for other researchers to use findings of this research investigation were compiled based on the results generated, consistent with the research question of this study. Findings of this research investigation focused on the previous four research questions presented in this study.

Correlation Between Independent Variables

Prior to conducting regression analysis, the results of correlation among independent variables revealed high correlation between multiple independent variables. Specifically, one key finding was a high level of positive correlation between certificates or degrees awarded and certificates or degrees awarded to economically disadvantaged individuals. Despite prior research outlining that performance-based funding models do not benefit admitting economically disadvantaged individuals, Texas' performance-based model does not specifically award for matriculating these students. Instead, the funding model was crafted by Texas lawmakers to award success points for any degree conferred, regardless of economic status of the student. The high level of correlation and between

both these independent variables may suggest that a high number of students who completed a certificate or degree from a Texas community college may be economically disadvantaged. However, because this was a statewide analysis, further research that is refined to specific community colleges or community colleges systems may produce different results as a result of certain populations and regions each individual community college serves. The multicollinearity of the variables may lead community college leaders to believe that the Texas performance-based funding model has already factored in economically disadvantaged students to its success output. For example, if data indicates a high correlation between certificates or degrees awarded and certificates or degrees awarded to economically disadvantaged systems, this correlation may create a false positive in related to attention to economic status. However, state lawmakers should use caution with this assumption as these findings in this study are holistic to state completion rates. For example, moderating factors that are prevalent to certain community colleges based on location and population served may have an impact on relationship between variables.

Another major finding in relation to multicollinearity was the low level of multicollinearity between time to certificate or degree and other independent variables. Interestingly, despite the lack of multicollinearity between time to certificate or degree completion and other independent variables, time to certificate or degree completion was not a direct outcome measure that community colleges administrators were awarded for at the time of this investigation. Although community colleges were not awarded directly, community college leaders may recognize the importance of matriculating students in an optimum timeframe in order to secure funding for that student. Put simply, the longer a

student remains in student status prior to graduating, the longer it takes for community college administrators to secure funding for that student. As such, this finding is noteworthy for administrators to understand the relationships between time to certificate or degree completion and success points generated. As there were currently no direct metrics for time to certificate or degree completion at the time of this investigation, this finding may encourage state lawmakers to look at the correlation between time to certificate or degree completion to determine if this outcome needs to be considered for funding. Although time to certificate or degree completion is not a direct outcome measure to performance-based funding implemented by Texas lawmakers, time to certificate or degree completion was a variable that is influential to the outcomes of performance-based funding at the time of this study.

Student Demographics – Treated Independently

As previously mentioned, McKinney and Hagedorn (2017) argued that as performance-based funding models become a driver for survival, many community college leaders and administrators may create policies that attract certain groups of students (e.g., top performers). Moreover, as previously discussed, prior research indicated that Black men were less likely to generate performance-based funding based on the number of success points awarded for their institution compared to Asian students (McKinney & Hagedorn, 2017). This potential selectivity of enrollment practices by community college leaders was outlined by Gándara et al. (2017) as a consequence of performance-based funding models. Due to the extensive research that performance-based funding may have unintended consequences on student enrollment and demographics of student enrollment, an extensive portion of this study was developed to

determine whether there was a statistically significant relationship present, and if so to what degree, between student demographics and the generation of student success points. Despite prior research that addressed the concern of selective enrollment practices as an unintended consequence of outcome-based performance-based funding, student demographics were not a variable identified by Texas state lawmakers as contributing directly to student success points (i.e., community colleges did not receive funding solely based on enrollment of certain student groups) at the time of this research investigation.

In this study, tested independently of other independent variables separately, each ethnic group independent variable was related to the variability of success points. This finding supported the research question of the relationship between individual student ethnic groups and success points. These findings are relevant for both community college leaders and state policymakers in determining whether student demographics have a negative or positive impact on success point generation. Hispanic students contributed to the most variation success points at 87.0%, more than any other ethnic group. State lawmakers should be aware of the population community colleges are serving. Dependent upon the primary community population that community college leaders serve, the ability to meet certain predetermined outcome metrics may differ from one community college to another. Moreover, because the ethnic group population surrounding a community college contributes to the enrollment makeup of that community college, state lawmakers should think *outside the box* when determining which metrics are appropriate for each individual institution. It is apparent that ethnic groups both individual and as a group contribute to the changes in success points. Independently, analysis revealed that all ethnic groups statistically significantly explained

the variance of success points. In this statewide analysis, Hispanic students explained the most variance at 87.0%. However, what is not apparent is how lawmakers are adapting to the uniqueness of these results from institution to institution. Although International students contributed the lowest change in success points, this does not discount the importance of this student population. If a decrease in student population automatically constitutes a decrease in success points, there may be a flaw in the process in determining the importance of success points. As mentioned, the relationships between increased student success points and admission of certain ethnic groups may be indicative of a potential flaw in the current funding model, where institutions are not rewarded for admitting students of certain ethnic groups. If community colleges leaders are not awarded for recruiting low-population students, the lack of incentive may shift the focus away from these student groups in methods of both recruitment and retention. Although community colleges are primarily open enrollment, certain recruitment techniques or resources could be implemented in order to increase enrollment of one student group over another. Institutional leaders may be for forced to reevaluate enrollment practices, which includes the shifting of resources to recruit students outside of a general service population. This shifting of attention may be done to ensure students who are being admitted to the community college have a higher likelihood of securing funding through the generation of success points. Moreover, as attention to online learning becomes more prevalent, an unintended consequence of performance-based funding may be that institutional leaders may shift focus to different learning modes that may generate the most success points in the quickest manner, potentially neglecting certain groups of student population groups. Even if open enrollment and admission continues for

community colleges, institutional leaders may find ways to recruit and retain students who are more likely to be successful through the completion of outcome metrics. Many community colleges have ensured that resources have been allocated to have programs that support first generation college students or first time in college students. Inattention from a state level to the importance of supporting these programs and specific enrollment initiatives by community college leaders may create unintended consequences that jeopardize the continuation of these programs. Community college leaders may feel forced to reallocate these resources to areas that will be generate more performance funding.

Moreover, a limitation of this finding is that these data involve a statewide analysis. As previously mentioned, the Texas community college demographics are vast and consists of 50 community colleges ranging from small to very large in student population and are spread out among six regions across the state (TACC, 2019). From a statewide analysis, these findings were not surprising, as increases in student population may be related to increase in success points for that specific ethic group (i.e., Hispanic students represented the higher enrollment total and International students represented the lowest enrollment total). However, community college enrollment is diverse. Some community colleges may predominately serve Hispanic student population, where other community college serve a more rural student population. As such, a statewide analysis may not be representative of individual community colleges, or even groups of community colleges in specific demographic regions. Moderating variables such as geographical location and socio-economic status of the student population may be contributing factors for individual community college with the completion of outcomes.

Another implication of this finding is that although individually all student ethnic groups statistically scientifically contributed to the variance in success points, state lawmakers may need to review these findings more im-depth to determine if geographical location of the community colleges, or, other factors such as student population, or open-access policies are correlated with this finding.

Student Demographics Combination

When examining each ethnic group individually, all ethnic groups explained the variance in success points in a statistically significant way. This finding itself did not answer the research questions associated with what combination of ethnic groups contributed to the variance in success points. However, to address research question of whether there was a statistically significant relationship present between the combination of students enrolled by demographic in Texas community multiple regression models were created. The findings of a combination of ethnic groups combined may be more indicative of community college enrollment demographics. In this study, the model that most contributed to the variation of success points that was not multicollinear was the combination of Black students, Hispanic students, and White students, contributing 96.5% of the change in success points. This model also consisted of the highest student enrollments during the time of this study. This finding may give community college leaders and state lawmakers an understanding of the degree or impact that the largest enrolled ethnic groups have on the generation of student success points. Moreover, this finding may also help both state lawmakers and community college leaders realize that attracting students in these ethnic groups should not be viewed as deficit. Although Black students were a highly enrolled student population, this student group contributed less to

the prediction of success points than both Hispanic students enrolled and White students enrolled. Each of these student ethnic groups generated the largest amount of success points during the research period. This finding may also suggest that certain ethnic groups, when combined with other ethnic groups, do not statistically significantly contribute to success point variance. This may leave some administrators to question the need to recruit students of certain ethnic groups that may not contribute positively to performance-based funding.

Interestingly, this finding may be contrary to many concerns that institutions may be penalized for admitting students who are economically disadvantaged. Since larger community college systems may have opportunities to admit more students which may result in the admission of students on a certain ethnic group, these institutions receive funding that is consistent with its student population. Additionally, due to open-access admission of students, community college funding may be dependent upon the demographic or economic situation of the students they serve. As a result, how funds are disseminated through performance-based funding and success points may not be consistent with meeting the needs of who the community college serves. This scenario indicates that a statewide implementation and blanket outcomes may be more beneficial for some community college more than others. If community colleges are located in areas that primarily served underrepresented groups, these institutional leaders may be affected adversely by the lack of success of some students. Also, because community colleges are awarded funding based on the completion of success points, students who require developmental education or take more time than other students to complete these required developmental courses will generate funding less quickly than other students.

Community colleges are also unique to the student population they serve. A community college located in an area with higher International population will more than likely admit these students over community colleges that do not serve this student group.

Moreover, just because International students, Asian students, and Other students were not included in the model of the highest enrolled students, this particular finding does not suggest that this student demographics are not an important ethnic group to consider with performance-based funding. State lawmakers should be cognizant of these findings to ensure student groups are not being eliminated is discounted from discussion of performance-based funding. This finding may also drive state lawmakers to find creative ways to include underrepresented populations that do not contribute a high percentage of enrollment for particular community colleges as an integral part of performance funding. This finding simply suggests that with the combination of these three major ethnic groups, these other groups are not statistically significant to the variance in change in success points.

State lawmakers should recognize this and determine which outcome measures could be relevant to the admission of more Asian, International, or Other students. More intentionality into the implementation of outcome measures would ensure that individual institutional mission was considered in determining success measures. Moreover, this intentionality would also ensure that certain student ethnic groups are not unintentionally disregarded in the creation of these outcome metrics.

Certificate or Degree Completion a Major Contributor to Success Point Variance

Certificate or degree completion was a major component of the Texas performance-based funding model at the time of this research study, as state lawmakers

awarded the most success points to degree or certificate completion. Although Texas state lawmakers have decided to decrease the weight assigned to certificates or degrees awarded and shift that weight towards STEM degrees awarded and students who transfer, certificate or degree completion remains an integral part of performance-based funding. During the time of this study, Texas lawmakers assigned the most weights to certificate or degree completion in a STEM or other critical field (2.25 points), certificate and degree completion (2.0 success points); and transferring to a university after the completion of 15 semester credit hours (2.0 success points). In this study, in order to effectively add to existing research and contribute new data regarding certificate or degree completion, as well as factoring in the amount of success points generated statewide, the relationships between certificate and degree completion and success points were assessed. As previously mentioned, one of the major goals of policymakers who implement performance-based funding for their colleges is to promote the attainment of education and degree completion (Li, 2017). This goal is evident in how Texas lawmakers have structured the performance-based funding metrics. Li (2017) argued that despite these completion metrics, these funding measures often do not deliver the intended results and in some cases produces negative results in completion (Li, 2017). As such, some state policymakers have adapted their funding metrics to give more weight to degree completion than certificates (Li, 2018). =This research study added to existing research and addressed the use of certificate or degree completion as a major outcome to success points. As expected, due to the emphasis put on degree completion and the awarding of success points by state lawmakers, completion was a major reason for variation in changes to success points. Certificate or degree completion treated separately

as an outcome variable contributed the majority of the variance to success points. However, what this finding does not suggest is that certificate or degree completion in itself is the sole reason for success point changes. There may also be other variables, combined with certificate or degree completion, that could have an impact on the variance in success points.

As previously identified, when combining all independent variables, certificate and degree completion contributed the largest explanation to the variance in success points. Moreover, when factoring standardized weights, certificate and degree completion had the highest importance in the prediction of success points in any evaluated model. Another key finding in Model 1 was that Black students and students of other ethnicities were negatively related to the generation of success points. As previously mentioned, for every approximate 7,680 Black students enrolled, there was a decrease in success points of approximately 1,312. For every approximate 2,357 students of other ethnicities, there was a decrease of approximately 450 success points. Findings in this model reveled that despite including student demographics as independent variables, certificates or degrees awarded was most positively related to success points variance. This finding may suggest that the weights assigned to certificate and degree completion are causing unintended consequences, as enrolling students of certain ethnicities had an inverse relationship to the generation of success points. There has been little evidence that certificate or degree completion in itself is the reason for increased student success at Texas Community colleges, although state lawmakers have created degree completion as a major outcome variable of students in awarding success points. As such, success points have become in part the product of certificate or degree completion. State lawmakers have clearly

communicated the perceived importance of certificate or degree completion by assigning some of the funding weight to this area. As such, I have called this practice the self-fulfilling belief phenomenon of Texas performance-based funding. Put simply, it's not surprising that the more students a community college move through graduation, the more success points they receive (i.e., funding). Likewise, it's also not surprising that community college leaders may focus more on certificate or degree completion because it has the highest funding, regardless of institutional mission. Moreover, as presented in this study with the variables used, certificate and degree completion was the highest correlated independent variable to success point and had the most important relationship to the positive change in success points when assessing standardized weights.

Certificate or degree completion is also a good outcome to communicate to stakeholders, including stakeholders who fund higher education, such as the Bill and Melinda Gates Foundation. Moreover, this belief phenomenon assumes that the more weight assigned to a specific area, the more likely state lawmakers will receive the desired results for that metric. As previously mentioned, the principal-agent theory supports this thought process, as the agent (i.e., community college leaders) are awarded for completing the desired outcomes of the principals (i.e., state policymakers). In the same way, if state lawmakers choose another outcome to assign the highest weight, this metric could be given the attention, just as certificate or degree completion is for Texas community colleges. In short, state policymakers have the influence and authority to predetermine what outcome metrics are important and then expect that these outcome metrics will become important to community colleges. Moreover, regardless of which

multiple regression model that was built, degree completion contributed most to the variance of success points compared to other variables.

Time to Certificate or Degree Completion

As previously mentioned, time to certificate or degree completion as a sole independent variable was a statistically significant predictor of success points and accounted for 15.8% of the explained variability of success points. This finding addressed the research question of the relationships between time to certificate or degree completion and student success points. Moreover, after testing a combination of models with independent variable that were statically significant to the change in success points, the optimal model in which independent variables that were not highly correlated included time to certificate or degree completion. Other independent variables included in this model were degrees awarded, Black student enrolled, and White students enrolled. Although time to certificate or degree was statistically significant in the linear regression model, regression weights of the multiple regression model revealed that time to certificate or degree had little relevance to differences success points. Moreover, in any model constructed, time to certificate degree, rather statistically significant or not, was not important to the explanation of the variance in success points based on standardized weights. As previously indicated, time to degree completion was the only independent variable without high levels of multicollinearity between any independent variables. Despite this lack of multicollinearity, as well as the emphasis on certificate or degree completion in 60x30TX, Texas state lawmakers have not identified time to certificate or degree completion as outcome funded directly by the awarding of success points. As identified in results, the lack of importance on the variance in the dependent variable of

success points may be a product of the lack of attention and funding contributed to this outcome by state lawmakers. Moreover, this finding suggests that although time to certificate or degree completion was a statistically significant contributor to the variance in success points independently and in some models, state lawmakers may believe that the correlation with other variables encourage timely certificate or degree completion.

As previously mentioned, in 60x30TX, there is an emphasis on certificate or degree completion by the 2030. However, time to certificate or degree completion has remained an outcome variable that is not directly awarded. This finding is important because as community college leaders may have the expectation of moving students through the educational process to graduation in a timely manner, community colleges are not being directly awarded for doing so. This lack of direct support may force community colleges administrators to reevaluate their overall mission and internal definition of student success. For example, although time to certificate or degree completion is not a metric directly associated with performance-based funding, it is deduced that that graduating students in a timely manner is critical to performance-based funding, as timely graduation rates result into the outcome metric of graduating students being fulfilled. If focus is turned to certificate or degree completion, there may be a population of students left out of the discussion of student success. This student population may be students who do not graduate or transfer prior to the ability to generate a significant amount of success points. Regardless, despite not being a direct performance-based funding outcome, the implied connection to degrees awarded may encourage community college leaders to continue to find ways to meet state performance outcomes, while also trying to address the entire student population. State lawmakers

may need to evaluate outcome measures to include more measures that are not assisted with degree completion or time to degree completion if individual institution missions are taken into consideration when creating performance-based funding policies.

Recommendations

There are many recommendations that will benefit state lawmakers, community college decision makers, and future researchers. These recommendations are courses of actions that researchers, state lawmakers, and community college leaders can take based on the findings of this research. Lawmakers can benefit from future research in making funding decisions that will impact community colleges from both a statewide and individual community college standpoint. Community college leaders will benefit from having data associated with the achievement of student outcomes and to understand the trajectory and impact of performance-based funding for their institutions. Continued research in the field of performance-based funding will help educate both state lawmakers and community college leaders of the viability of performance-based funding. This section of recommendation is divided into multiple sections: (a) recommendations for state lawmakers; (b) recommendations for community college leaders; and (c) recommendations for future research.

Recommendations for State Lawmakers

At the time of this research study, Texas lawmaker had not created or revised the performance-based funding model that directly rewarded community colleges for admitting students that are economically disadvantaged. As previously mentioned, Colorado lawmakers were the first to assign a metric directly based on the admission of minority students and low-income students, assigning 20% of the states' performance

funding to minority enrollment and 20% of the state's funding to low-income enrollment (Gonzalez, 2020, June 1). Although Texas lawmakers, through their performance-based funding model, have awarded success points for areas such as completion of developmental education, there was no direct correlation between minority enrollment or low-income enrollment and the generation of success points. To the contrary, since the most success points were given to students through degree completion, community college leaders may be incentivized to admit students more likely to secure the most success points. State lawmakers should specifically evaluate the methods in which outcome measures are created and ensure that implemented or revised outcome measures do not penalize community colleges for admitting minority students or students that are more likely not to graduate based on low socioeconomic status. Instead, state lawmakers can develop more outcome measures that will award community colleges for admitting students who may be stereotyped as low achievers in order to achieve the mission of individual institutions. Due to current open-access enrollment models for community colleges, colleges leaders may be disadvantaged by the community of students they serve. For example, a community college that enrolls primarily low-income students may receive less funding than other community colleges. As such, state lawmakers should create performance-based funding policies that are consistent with the demographics to the specific region community colleges serve. These differences in institutional needs, missions, and goals can drive the creation of funding formulas unique to specific community colleges or regions of community colleges. For example, although some colleges may predominately serve low socioeconomic students, other colleges may have a lower enrollment total and serve a more specific student audience. These community

colleges could be located in less diverse demographic regions compared to larger community colleges who may be a part of a system that serve a larger region of students. Put simply, a one size fits all model does not account for individual institutional missions.

Another recommendation for state lawmakers is to reexamine the purpose of performance-based funding and the necessity of performance-based funding through continued communication with community college presidents, board of trustees, and other institutional leaders. Institutional leaders can provide feedback regarding funding metrics that best represent the demographics that institution's student makeup. As previously mentioned, more success points are awarded for degrees awarded than another other outcome measure. This is partly due to the weighting of the outcome measure by state lawmakers. As such, as state lawmakers shift their desired outcome measures, community college leaders will shift their institutional focus. This type of principal-agents relationship can be detrimental to student success if not implemented or revised for adequate reasons. Communication from state lawmakers should also examine if funding for performance should be a statewide initiative or regional initiative. As previously mentioned, Texas community colleges are divided by six regions and have colleges that range from small to very large. Creating funding policies that assume that all colleges within all regions can achieve that same outcome metrics based on their unique serving population may be missing the mark on institutional mission and success.

State lawmakers should also work directly with the latest researchers of performance-based funding to help review and create ongoing performance-based funding measures. Although research is limited, as state lawmakers continue to add to or revise performance-funding measures, the available research associated with

performance-based funding will grow. Studies such as this study that focus on the relationships between outcome measures and performance-based funding can inform lawmakers of any correlations or lack of correlations between the outcome measure they have implemented and student success. This type of connection to research can also help lawmakers become aware of additional metrics that should be considered that currently are not considered when creating new policies.

State lawmakers can also evaluate the percentage of funding that is being set-aside for performance-based funding. As previously mentioned, Texas state lawmakers have implemented performance-based funding 2.0, meaning that funding in a part of their state funding total, rather than an incentive, or additional funding for success. The expectation has been created by Texas state lawmakers to encourage student success rather than just enrollment. However, just over 10% of funding is reserved for performance. Larger community colleges leaders who are able to secure more state funding by enrolling more students may be less effected by performance-based funding. However, for smaller institution, 10% of the overall state-allocated funding may be more challenging. As such, creating tailored funding metrics dependent upon institutional enrollment may be a beneficial way for state lawmakers to ensure equity in distribution of funds.

Finally, state lawmakers should be open to drastic changes in the makeup and structure of performance-based funding. Up to this point, little changes have been done to ensure community college leaders that individual institutional mission is a concern during the implementation of outcome metrics. Put simply, there is little evidence to suggest that performance-based funding is anything more than checked boxed by state lawmakers in

order to receive funding for agenda-setting organizations. The responsibility should be on state lawmakers to ensure community college leaders that their best interest is at state. This would include having key community college officials, from every Texas region, is assigned to a taskforce to review and make recommendations to state lawmakers on performance-based funding measures. This will ensure that both institutional-level missions and state-level metrics are considered when changes to performance-based funding are implemented.

Recommendations for Community College Leaders

Community college administrators must be aware of the ever-changing funding environment from state lawmakers regarding performance-based funding. Although Texas state allocated funding was approximately 10% reserved for performance, this funding could increase as state lawmakers begin to review and mirror colleges aligning up to 100% of state funding to performance. As previously mentioned, it is important for community college administrators to understand how the structure of performance-based funding through the dissemination of student success points based on student outcome measures have impacts on college funding and the generation of student success points (Hanes 2017; Natale & Jones, 2018).

This type of education can be done through the review of literature and research and the hiring of key administration that understand performance-funding. Specifically, the hiring of key financial personnel, such as Chief Financial Officers who are aware of performance-based funding may increase the likelihood of aligning institutional mission with state outcome measures. Moreover, community Presidents and Chief Financial Officers should understand which outcome measures directly benefit or put them at a

disadvantage based on the major student demographics and ethnic groups they serve. This understanding can be achieved specifically by reviewing and adding to research and literature for their specific college or community college system. As noted, Dowd et al. (2020) emphasized the importance for college and university officials to obtain and create accurate and legitimate data. These data should be created by community college administrators who are knowledgeable in performance-based funding. Moreover, just as it was recommended for state lawmakers to communicate with institutional leaders in the creation of funding models, community college leaders should also communicate effectively with state lawmakers. This type of communication involves accurate transfers of challenges, struggles, and even advantages and disadvantages of performance-based funding. It is also critical for institutional leaders to provide key data to lawmakers and researchers that will assist with the ongoing development of performance-based funding models. If individual community colleges are not able to understand their own successes or failures in regard to performance-based funding, institutional leaders will not be able to advocate for their own institutional missions.

Lastly, community college leaders should train and educate their stakeholders. This education should not be limited to key community college executive officials, but also academic faculty. Every key outcome metric output as an academic input. Faculty must be aware of what is behind funding measure and what the impact this could have on classroom instruction and the integrity of teaching. The pressures assigned to faculty, both full-time and part-time in order to meet these outcomes must be understood and communicated. Moreover, community college leaders should follow-up closely with

these faculty to ensure that the expectations from performance-based funding is not compromising academic integrity or academic rigor.

Recommendations for Researchers

The data outlined in this investigation were the latest data available from the THECB at the time of the study. However, success points were awarded based on the average of three academic years, leaving opportunity for future research on this topic to understand the ongoing relationships between certain outcome measures and the generation of success points. As the THECB updates success point and variable data, researchers can use the latest data to inform both state lawmakers and community college leaders of the ongoing effect of performance-based funding. As community college revise mission statements and operational plans, this continued research using the most recent data available will allow community college and state lawmakers to understand the latest results and findings based on current and ongoing performance-based funding strategies.

Although this research investigation focused on quantitative results and findings based on these results, there is opportunity for researchers to follow-up on this study with qualitative, or even mix-methods research studies. Specifically, the results and findings of this study may allow researchers to further examine the effects of performance-based funding by interviewing state lawmakers and community college leaders. The quantitative results and findings of this study may create opportunities for continued conversations of the effect of performance-based funding. This continued qualitative research could potentially help researchers look for common themes or codes that are created as a result of performance-based funding. As previously mentioned, this may include speaking with high-level decision makers of Texas community colleges to

understand the perceived advantages or disadvantages associated with performance-based funding, including the discussion of the effectiveness of accountability measures on student success. Moreover, if willing, state lawmakers could provide information associated with the rationale associated with making certain funding decisions. In addition to evaluating current outcome measures, researchers should be aware of non-linear outcomes that may be beneficial to study to be able to interpret which outcomes or variables performance-based funding is not contributing to. These non-linear relationships could identify gaps or opportunities for lawmakers to identify unintended consequences of performance-based funding and to ensure that the completion of outcomes and variables that are essential to students success are being awarded. Moreover, researchers should be aware of extraneous variables, that if not addressed, could further widen the gap of equity between community colleges and funding. These variables may recognize those programs that are costly to maintain but necessary to support low-income students and students that are not prepared academically when entering college.

Researchers should better understand the results of how performance-based funding is disseminated to community colleges in Texas. Evaluating how certain funds are being disseminated to various community colleges across regions may better help state lawmakers understand the unintended consequences facing marginalized and at-risk populations, particularly when too excessive weight is assigned to specific outcomes over others. Researchers should also assess the consistencies or inconsistencies with states' equity measures against any performance-based funding measures to ensure that there is a correlation between responsibility and accountability. Moreover, how colleges are

required to adapt to performance-based funding measures must be addressed. This includes determining how current and ongoing fiscal policies shift institutional priorities, including fiscal management.

Additional studies that show the effects of Texas performance-based funding in comparison to states that have more established or higher levels of performance-based funding may be beneficial. Researchers can conduct this continued research through more policy diffusion related research looking at the effects of performance-based funding adoption from other states. In addition to assessing different state models and outcomes, researchers should focus on the methods of how other designs have been created and implemented. This includes assessing variations of designs and comparing those designs with the current and ongoing designs for Texas. This assessment will also require a clearer understanding of the process of actual planning and building of performance-based funding models.

Researchers can also compare state outcome progress with states that have more established and implemented programs, such as Tennessee or Ohio. Additionally, due to the changing metric system in Texas performance-based funding, researchers can continue to create research that is consistent with the changing weights of performance-funding. Future research should not only include observations form prior research such as this study, but also include new independent variables as weights are changed or new variables are added or deleted from funding models.

Conclusion

As previously mentioned, the problem addressed in this study were the perceived imbalances, inequities, or consequences between state-implemented performance

measures and student demographics and success points generated at Texas community colleges. Several key findings, implications, and recommendations for state policymakers, community college leaders, and researchers were addressed in this study. Texas state policymakers have relied on several outcome measures that community college leaders are evaluated against in the implementation of performance-based funding. Prior researchers have communicated the importance of ensuring that community college leaders are not penalized for admitting certain ethnic groups. As such, this study outlined the relationships between certain outcome measures and student ethnic groups and the generation of student success points and identifies variables that are positively and negatively related to the generation of success points. Future researchers may use this existing research to not only understand the relationships between state implemented outcome measures and performance-based funding, but also as a tool to identify unintended consequences of performance-based funding. Despite challenges associated with these unintended consequences of performance-based funding, community college leaders should understand performance-based funding policy and adapt to mandated outcome metrics, without abandoning their own institutional mission. Likewise, state policymakers must be aware of the impact and unintended consequences performance-based funding has on institutional missions and at-risk and disadvantaged students.

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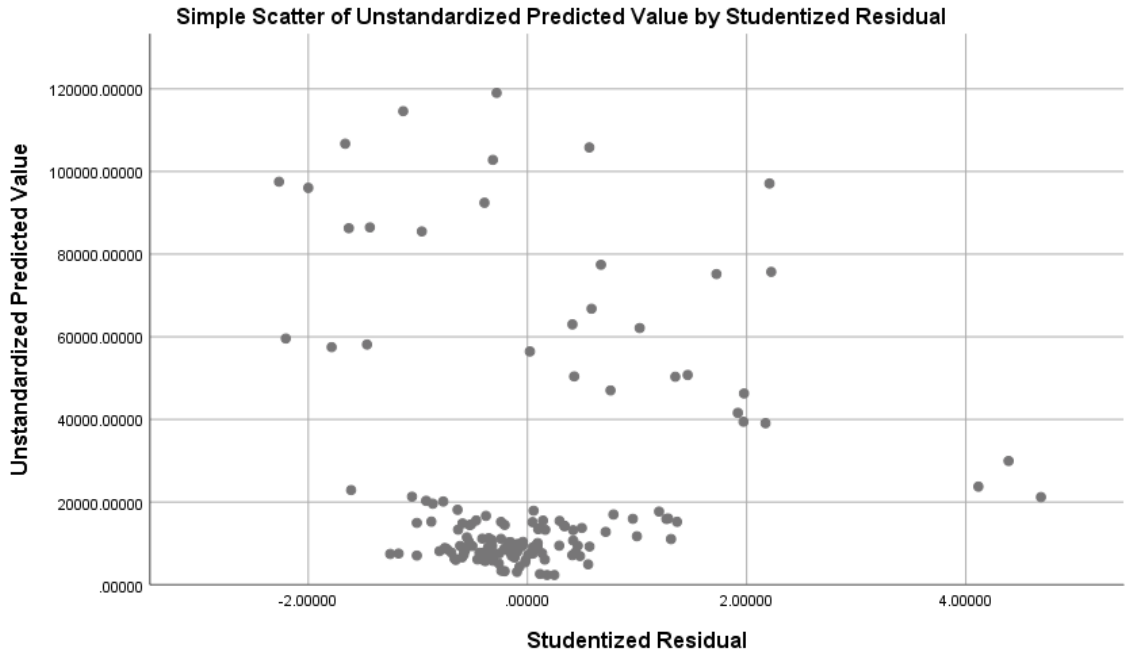
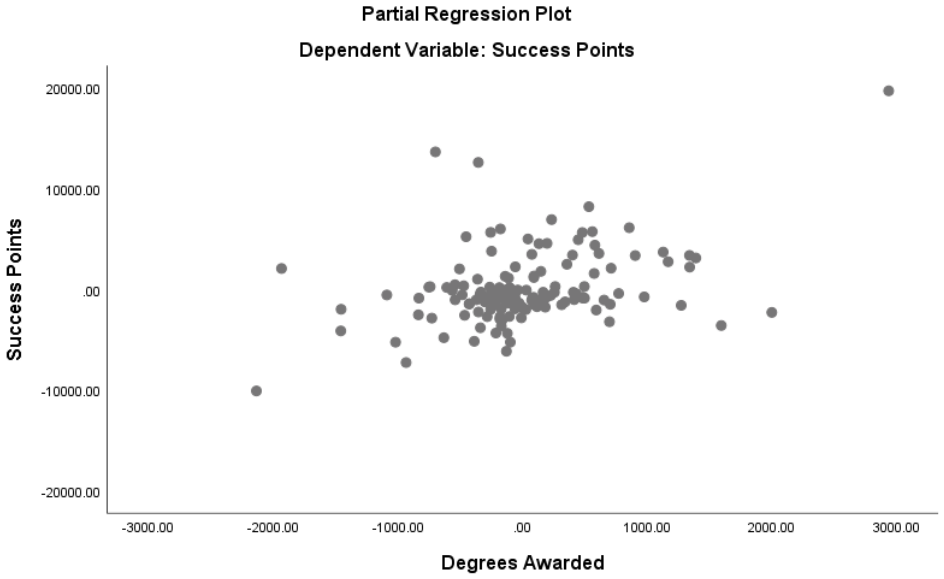
APPENDIX A

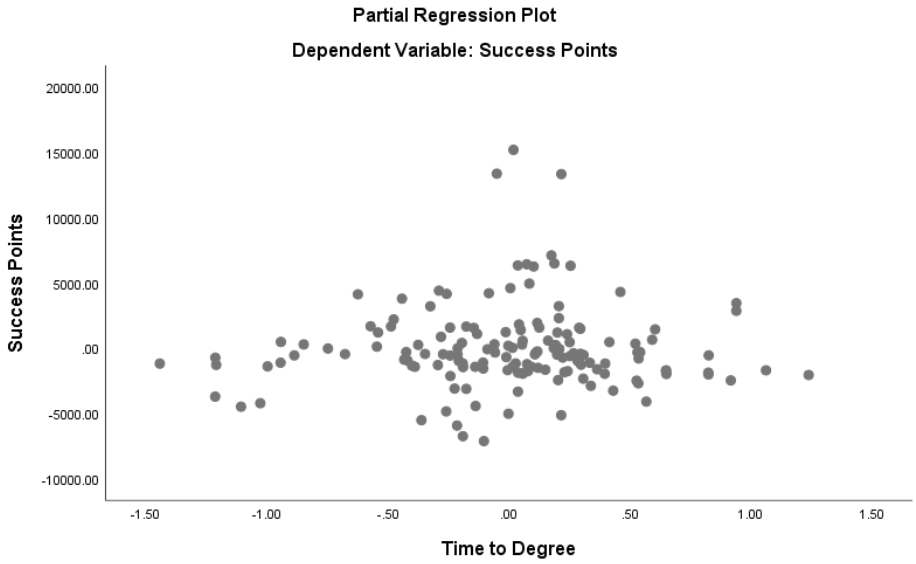
Scatter Plot – Certificates or Degrees Awarded





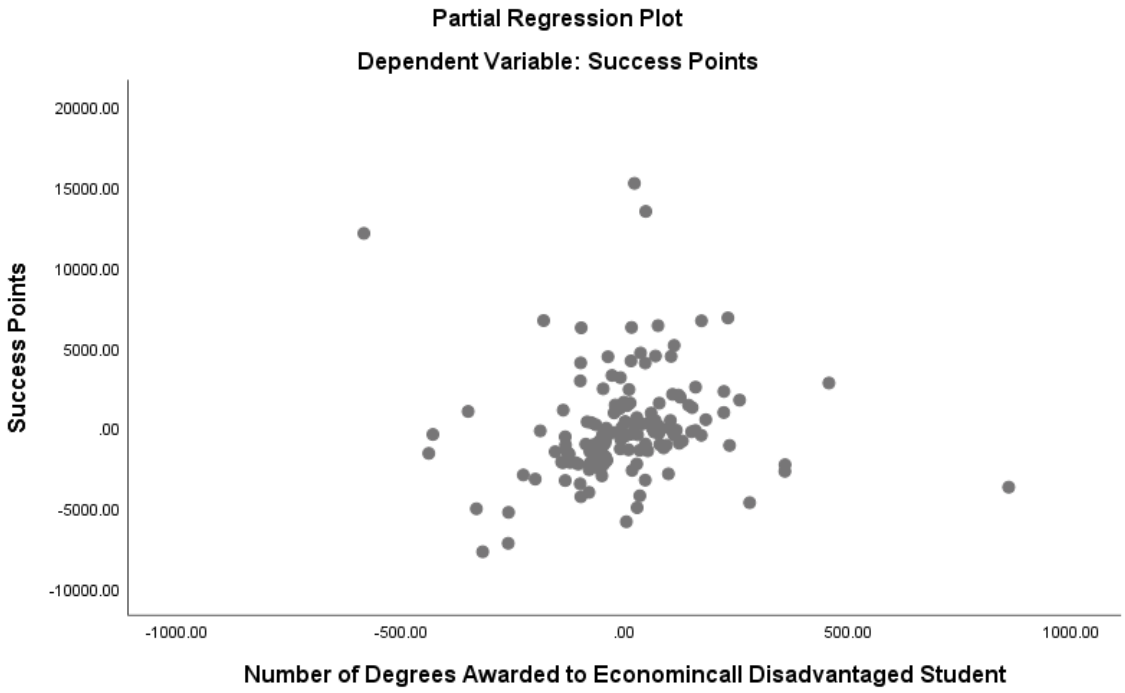
APPENDIX B

Scatter Plot – Time to Certificate or Degree



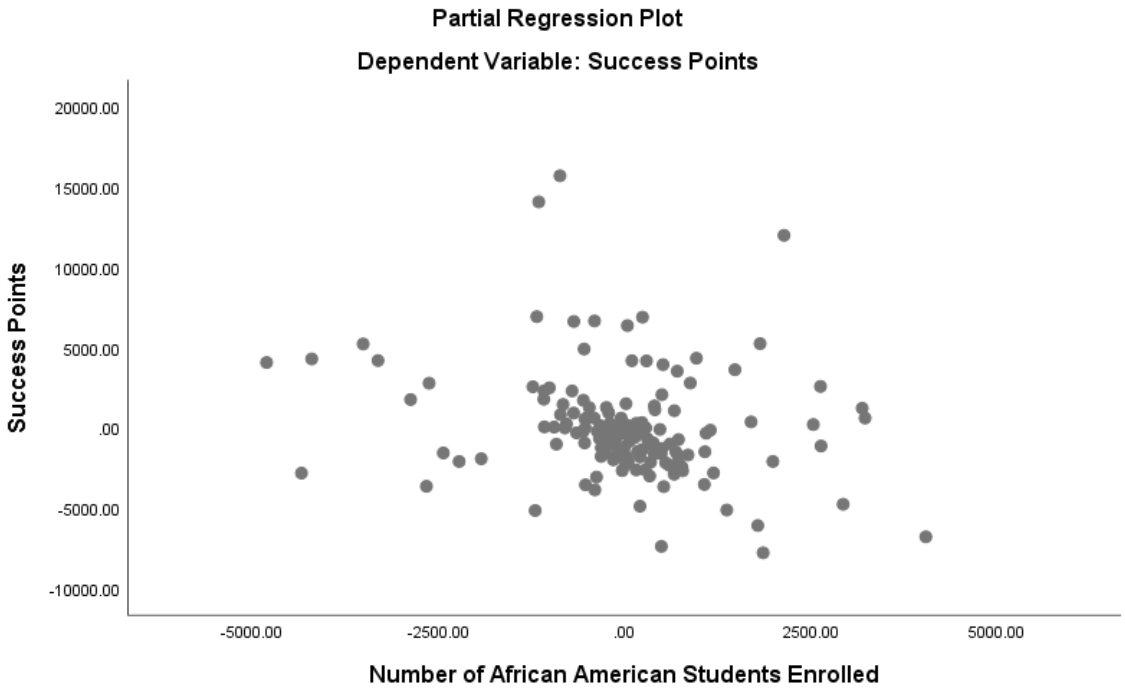
APPENDIX C

Scatter Plot – Certificates or Degrees Awarded to Economically Disadvantaged Students



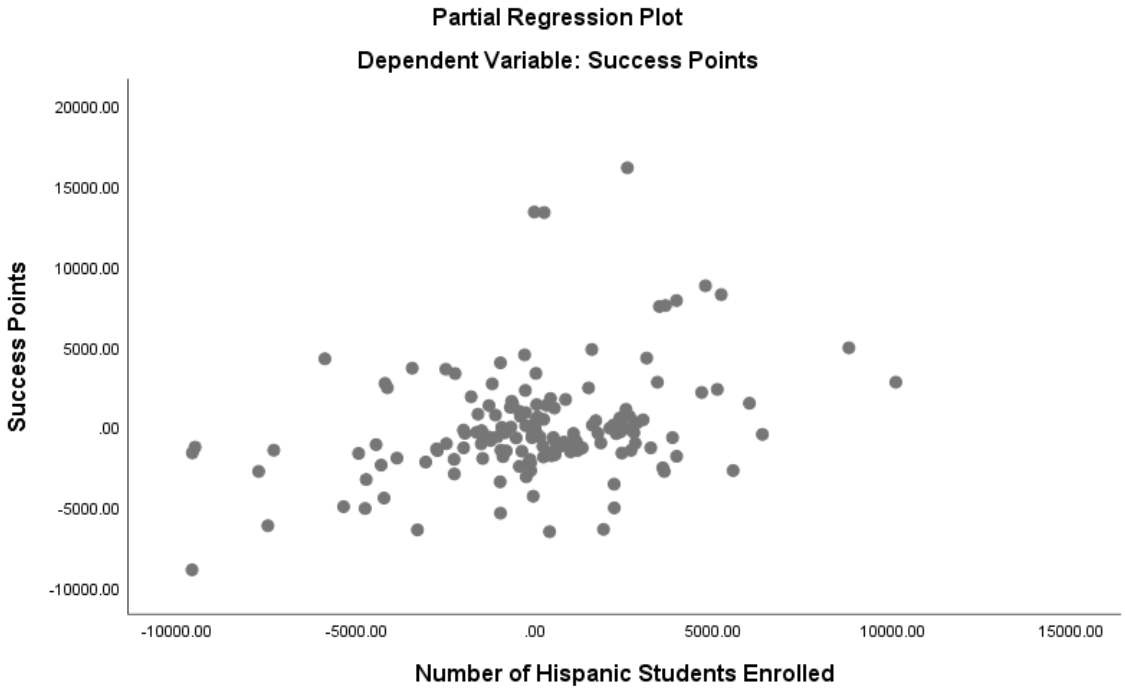
APPENDIX D

Scatter Plot – Certificates or Degrees Awarded to Black Students



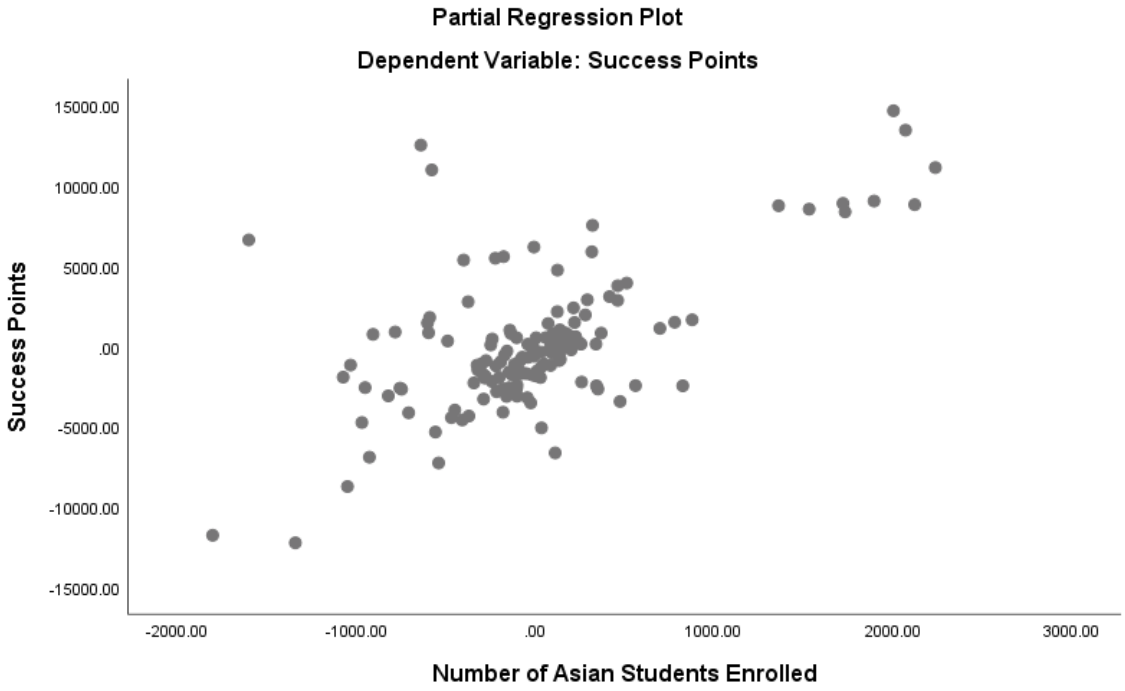
APPENDIX E

Scatter Plot – Certificates or Degrees Awarded to Hispanic Students



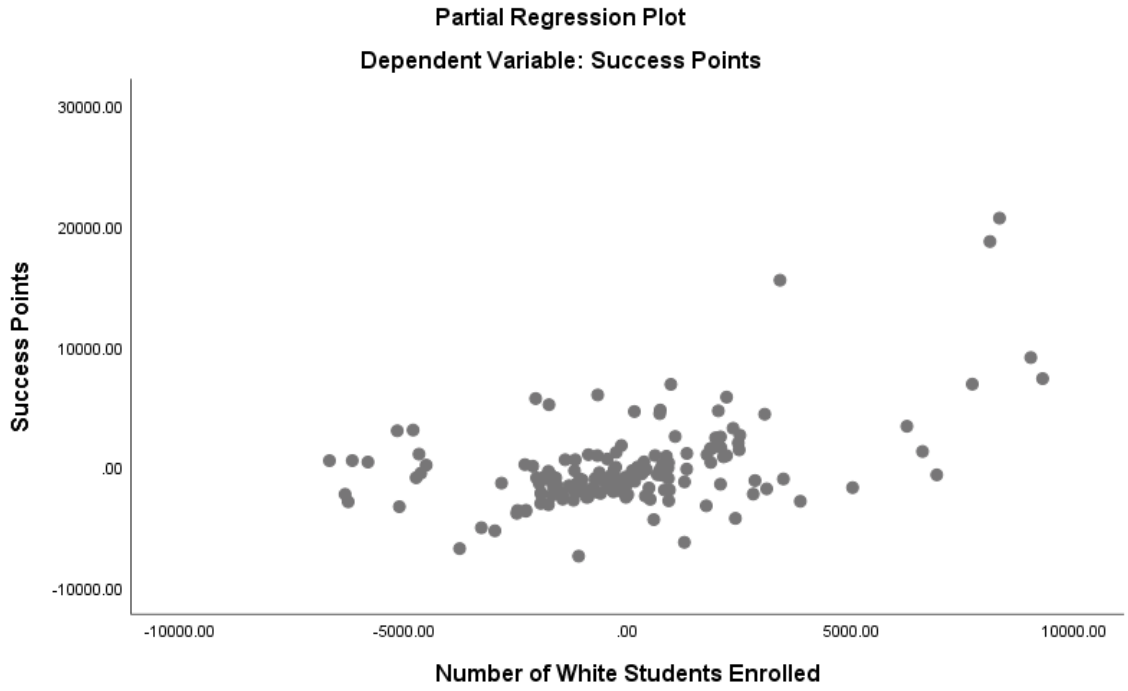
APPENDIX F

Scatter Plot – Certificates or Degrees Awarded to Asian Students



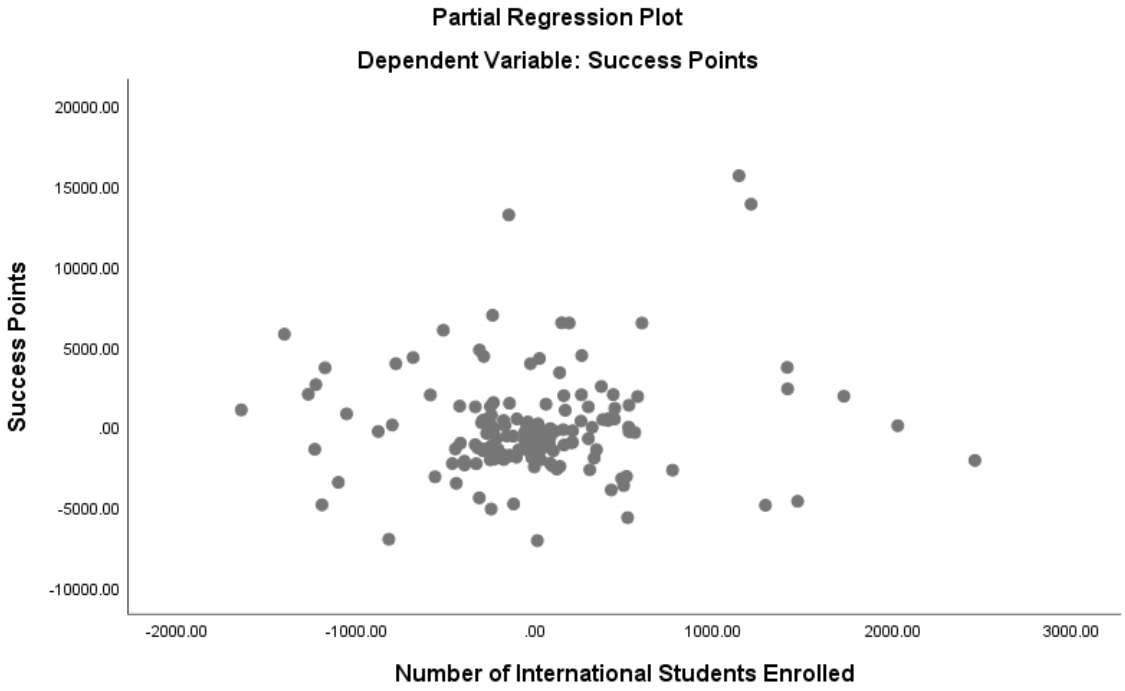
APPENDIX G

Scatter Plot – Certificates or Degrees Awarded to White Students



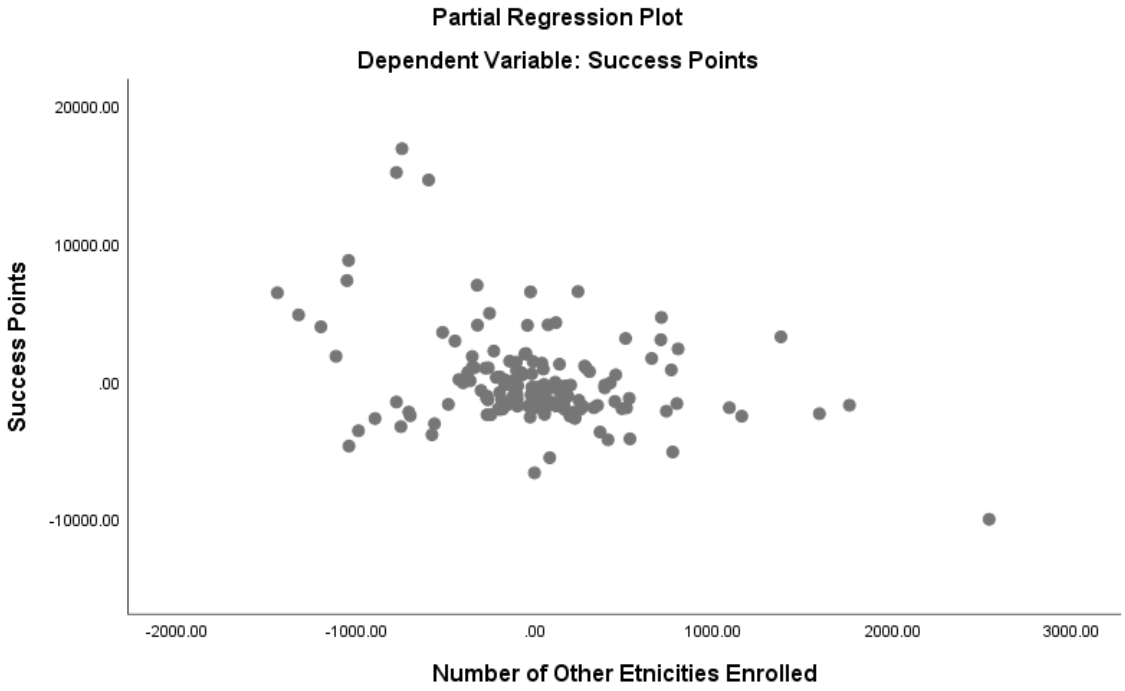
APPENDIX H

Scatter Plot – Certificates or Degrees Awarded to International Students



APPENDIX I

Scatter Plot – Certificates or Degrees Awarded to Students of Other Ethnicities



APPENDIX J

Descriptive Statistics 2017

	N	Minimum	Maximum	Mean	Std. Deviation
Success Points	50	2781.00	103424.00	22565.5800	27410.12145
Degrees Awarded	50	280.00	18080.00	3491.1600	4449.27543
Number of African American Students Enrolled	50	14.00	40053.00	3932.7000	8077.67808
Number of Hispanic Students Enrolled	50	122.00	64152.00	10596.1400	16347.73354
Number of Asian Students Enrolled	50	12.00	13238.00	1374.4600	2974.69870
Number of White Students Enrolled	50	223.00	49076.00	9121.7000	11636.72460
Number of International Students Enrolled	50	1.00	13822.00	694.6200	2292.94640
Number of Other Ethnicities Enrolled	50	45.00	15109.00	1385.2600	2609.37073
Number of Degrees Awarded to Economically Disadvantaged Student	50	102.00	6626.00	1166.0400	1436.19916
Time to Degree	50	2.40	5.40	3.9260	.55180
Valid N (listwise)	50				

Descriptive Statistics 2018

	N	Minimum	Maximum	Mean	Std. Deviation
Success Points	50	2575.00	111532.00	23161.7600	28154.33711
Degrees Awarded	50	240.00	20038.00	3751.3000	4746.03187
Number of African American Students Enrolled	50	16.00	39292.00	3881.6400	7976.52185
Number of Hispanic Students Enrolled	50	121.00	65427.00	10846.7400	16778.15261
Number of Asian Students Enrolled	50	9.00	12899.00	1386.1600	2994.82020
Number of White Students Enrolled	50	303.00	48972.00	8774.0000	11119.12625
Number of International Students Enrolled	50	.00	15854.00	712.6200	2506.51084
Number of Other Ethnicities Enrolled	50	55.00	12610.00	1288.4600	2307.78451
Number of Degrees Awarded to Economically Disadvantaged Student	50	94.00	5923.00	1154.9400	1393.59848
Time to Degree	50	2.50	5.10	3.8116	.52953
Valid N (listwise)	50				

Descriptive Statistics 2019

	N	Minimum	Maximum	Mean	Std. Deviation
Success Points	50	2591.00	118287.00	23751.1800	28913.26935
Degrees Awarded	50	108.00	20905.00	3815.6800	4786.19105
Number of African American Students Enrolled	50	21.00	38886.00	3781.4200	7681.53649
Number of Hispanic Students Enrolled	50	84.00	68059.00	11150.9600	17044.30746
Number of Asian Students Enrolled	50	7.00	13394.00	1400.2400	3010.01158
Number of White Students Enrolled	50	295.00	45522.00	8477.5200	10604.08296
Number of International Students Enrolled	50	.00	15975.00	670.0800	2468.14074
Number of Other Ethnicities Enrolled	50	54.00	12111.00	1289.1600	2182.53922
Number of Degrees Awarded to Economically Disadvantaged Student	50	39.00	5969.00	1156.7200	1378.58594
Time to Degree	50	2.20	4.90	3.7298	.51669
Valid N (listwise)	50				

Descriptive Statistics 2017 - 2019

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Success Points	150	2575.00	118287.00	23159.5067	27980.47174	1.837	.198	2.293	.394
Degrees Awarded	150	108.00	20905.00	3686.0467	4633.65891	2.051	.198	3.567	.394
Number of African American Students Enrolled	150	14.00	40053.00	3865.2533	7860.65806	3.125	.198	9.458	.394
Number of Hispanic Students Enrolled	150	84.00	68059.00	10864.6133	16614.78622	2.077	.198	3.378	.394
Number of Asian Students Enrolled	150	7.00	13394.00	1386.9533	2973.07404	2.655	.198	6.218	.394

Number of White Students Enrolled	150	223.00	49076.00	8791.0733	11056.18547	2.247	.198	4.389	.394
Number of International Students Enrolled	150	.00	15975.00	692.4400	2408.05361	5.110	.198	27.205	.394
Number of Other Ethnicities Enrolled	150	45.00	15109.00	1320.9600	2357.79452	3.560	.198	14.178	.394
Number of Degrees Awarded to Economically Disadvantaged Student	150	39.00	6626.00	1159.2333	1393.56736	2.087	.198	3.642	.394
Time to Degree	150	2.20	5.40	3.8225	.53540	-.398	.198	.906	.394
Valid N (listwise)	150								

Model Summary Non Ethnic-Group Independent Variables

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.966[a]	.933	.933	7250.62838	.933	2070.937	1	148	.000	1.977

a. Predictors: (Constant), Degrees Awarded

b. Dependent Variable: Success Points

Model Summary Ethnic-Group Independent Variables

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson

1	.888[a]	.789	.788	12897.38561	.789	553.282	1	148	.000	1.869

a. Predictors: (Constant), Number of Asian Students Enrolled

b. Dependent Variable: Success Points

Model Summary - Degrees Awarded

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.966[a]	.933	.933	7250.62838	1.977

a. Predictors: (Constant), Degrees Awarded

b. Dependent Variable: Success Points

Model Summary – Degrees Awarded to Economically Disadvantaged

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.948[a]	.899	.898	8919.56922	1.609

a. Predictors: (Constant), Number of Degrees Awarded to Economically Disadvantaged Student

b. Dependent Variable: Success Points

Model Summary – Black Students Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.856[a]	.733	.732	14493.96845	1.923

a. Predictors: (Constant), Number of African American Students Enrolled

b. Dependent Variable: Success Points

Model Summary – Hispanic Students Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.933[a]	.871	.870	10101.65105	1.787

a. Predictors: (Constant), Number of Hispanic Students Enrolled

b. Dependent Variable: Success Points

Model Summary – Asian Students Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.888[a]	.789	.788	12897.38561	1.869

a. Predictors: (Constant), Number of Asian Students Enrolled

b. Dependent Variable: Success Points

Model Summary – White Students Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.875[a]	.766	.764	13585.20027	1.963

a. Predictors: (Constant), Number of White Students Enrolled

b. Dependent Variable: Success Points

Model Summary – International Students Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.663[a]	.440	.436	21008.30514	2.081

a. Predictors: (Constant), Number of International Students Enrolled

b. Dependent Variable: Success Points

Model Summary – Students of Other Ethnicities Enrolled

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.846[a]	.716	.714	14956.06016	1.812

a. Predictors: (Constant), Number of Other Ethnicities Enrolled

b. Dependent Variable: Success Points

Model Summary – All Independent Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.993[a]	.986	.985	3369.51189	2.061

a. Predictors: (Constant), Number of Other Ethnicities Enrolled, Time to Degree, Number of Degrees Awarded to Economically Disadvantaged Student, Number of International Students Enrolled, Number of White Students Enrolled, Number of Asian Students Enrolled, Number of Hispanic Students Enrolled, Number of African American Students Enrolled, Degrees Awarded

b. Dependent Variable: Success Points

Model 1 – Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.993[a]	.986	.985	3369.51189	.986	1126.060	9	140	.000	2.061

a. Predictors: (Constant), Number of Other Ethnicities Enrolled, Time to Degree, Number of Degrees Awarded to Economically Disadvantaged Student, Number of International Students Enrolled, Number of White Students Enrolled, Number of Asian Students Enrolled, Number of Hispanic Students Enrolled, Number of African American Students Enrolled, Degrees Awarded

b. Dependent Variable: Success Points

Model 1 – Regression Statistics

	Mean	Std. Deviation	N
Success Points	23159.5067	27980.47174	150
Degrees Awarded	3686.0467	4633.65891	150
Number of Asian Students Enrolled	1386.9533	2973.07404	150
Number of White Students Enrolled	8791.0733	11056.18547	150
Number of International Students Enrolled	692.4400	2408.05361	150
Number of Other Ethnicities Enrolled	1320.9600	2357.79452	150
Number of Degrees Awarded to Economically Disadvantaged Student	1159.2333	1393.56736	150
Time to Degree	3.8225	.53540	150
Number of African American Students Enrolled	3865.2533	7860.65806	150
Number of Hispanic Students Enrolled	10864.6133	16614.78622	150

Model 1 - Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	936.498	2199.045		.426	.671
	Degrees Awarded	2.197	.435	.364	5.052	.000
	Number of Asian Students Enrolled	4.133	.435	.439	9.501	.000
	Number of White Students Enrolled	.658	.097	.260	6.791	.000
	Number of International Students Enrolled	.397	.468	.034	.848	.398
	Number of Other Ethnicities Enrolled	-2.264	.510	-.191	-4.442	.000
	Number of Degrees Awarded to Economically Disadvantaged Student	1.969	1.734	.098	1.136	.258
	Time to Degree	353.204	587.178	.007	.602	.548
	Number of African American Students Enrolled	-.593	.212	-.167	-2.793	.006
	Number of Hispanic Students Enrolled	.366	.088	.218	4.171	.000

a. Dependent Variable: Success Points

Model 2 – Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.968[a]	.938	.937	7023.38684	.938	1108.924	2	147	.000	2.077

a. Predictors: (Constant), Time to Degree, Degrees Awarded

b. Dependent Variable: Success Points

Model 3 – Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.989[a]	.978	.977	4228.47858	.978	1063.535	6	143	.000	2.352

a. Predictors: (Constant), Number of Other Ethnicities Enrolled, Number of Hispanic Students Enrolled, Number of International Students Enrolled, Number of White Students Enrolled, Number of Asian Students Enrolled, Number of African American Students Enrolled

b. Dependent Variable: Success Points

Model 4 – Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.983[a]	.966	.965	5198.92783	.966	1389.958	3	146	.000	2.175

a. Predictors: (Constant), Number of White Students Enrolled, Number of Hispanic Students Enrolled, Number of African American Students Enrolled

b. Dependent Variable: Success Points

Model 5- Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.977[a]	.954	.953	6055.32723	.954	1011.807	3	146	.000	2.075

a. Predictors: (Constant), Degrees Awarded, Time to Degree, Number of African American Students Enrolled

b. Dependent Variable: Success Points

Model 6- Multi-Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.986[a]	.973	.972	4655.60915	.973	1309.249	4	145	.000	2.128

a. Predictors: (Constant), Number of White Students Enrolled, Time to Degree, Degrees Awarded, Number of African American Students Enrolled

b. Dependent Variable: Success Points

APPENDIX K

Sam Houston STATE UNIVERSITY
A Member of The Texas State University System

Date: Dec 21, 2020 5:27:50 PM CST

TO: Matthew Olmstead Matthew Fuller
FROM: SHSU IRB
PROJECT TITLE: Texas performance-based funding: Examination of relationships between success points and variables at community colleges
PROTOCOL #: IRB-2020-372
SUBMISSION TYPE: Initial
ACTION: Exempt
DECISION DATE: December 21, 2020
EXEMPT REVIEW CATEGORY: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Greetings,

Thank you for your submission of Initial Review materials for this project. The Sam Houston State University (SHSU) IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

*** What should investigators do when considering changes to an exempt study that could make it nonexempt?**

It is the PI's responsibility to consult with the IRB whenever questions arise about whether planned changes to an exempt study might make that study nonexempt human subjects research.

In this case, please make available sufficient information to the IRB so it can make a correct determination.

If you have any questions, please contact the IRB Office at 936-294-4875 or irb@shsu.edu. Please include your project title and protocol number in all correspondence with this committee.

Sincerely,

Chase Young, Ph.D.
Chair, IRB
Hannah R. Gerber, Ph.D.
Co-Chair, IRB

VITA

Degrees Awarded

Doctor of Education, Sam Houston State University (December 2021)
Higher Education Leadership
Huntsville, TX

Master of Arts, Dallas Baptist University (May, 2006)
Organizational Management
Dallas, TX

Bachelor of Arts, Sam Houston State University (December, 2002)
Speech Communication
Huntsville, TX

Professional Experience

2021-Present
Sam Houston State University (College of Education)
Director of Strategic Initiatives and Operations

2014-current
Lone Star College-CyFair
Adjunct Instructor of Business Management

2019-2020
Sam Houston State University
Director of Financial Planning and Budget

2014-2019
Sam Houston State University, College of Criminal Justice
Director of Budget and Administration

2010-2014
Lone Star College-CyFair
Director of Budget and Auxiliary Services

2006-2010
Lone Star College-Montgomery, BELS Division
Divisions Operations Manager

2004-2006
Sam Houston State University, College of Humanities & Social Services
Administrative Assistant II

2002-2004
Sam Houston State University, Department of Military Science
Administrative Assistant

1996-1999 Monitor Leader Publications
Reporter and Journalist

Publications

Walling, M. L., Van De Walker, D., Gilbert, K., Olmstead, M. L., & Lane, F. C. (2020). Student experiences in an online first-year seminar paired with remedial Mathematics. *The Journal of College Orientation, Transition, and Retention, 39*(1), 1-26. Retrieved from https://pubs.lib.umn.edu/index.php/jcotr/article/view/2442/2384

Professional Presentations

Walling, M. L., Van De Walker, D., Gilbert, K., & Olmstead, M. L. (February, 2019). *Student experiences in an online first-year seminar paired with remedial Mathematics*. Presented at the 42nd annual Southwest Educational Research Association (SERA) meeting, San Antonio, Texas

Courses taught, Lone Star College-CyFair, 2014-2020

BMGT 1309 Information and Project Management
BMGT 1327 Principles of Management
BUSI 1307 Personal Finance
BUSI 2035 Business Statistics
BUSI 2372 Business Analysis

Editorial Services

Editor-in-Chief, Newspaper, Trinity Valley Community College, 1997-1998
Sports Editor, Newspaper, Trinity Valley Community College, 1997
Editor-in-Chief, Yearbook, Mabank High School, 1996-1997

Professional and Association Memberships (current)

National Association of Colleges and University Business Officers (NAUCBO)

Professional Services

2019	Financial Advisory Collaborative Team (FACT) representative, Sam Houston State University
2014	Student Learning Outcome committee representative, Lone Star College-CyFair

2012	System representative, copier and printing services RFP, Lone Star College System
2012	Travel process committee representative, Lone Star College System
2011	Hiring committee representative, system payroll director, Lone Star College System
2010	First Year Experience assessment representative, Lone Star College-Montgomery
2009	Enterprise Resource Planning representative, Lone Star College-Montgomery

Awards and Honors

Dean's Outstanding Research Paper 2018
Employee Leadership Academy, Sam Houston State University 2016-2017
Leadership Academy, Lone Star College, 2016-2017
Dean's List, Sam Houston State University, 1999-2002
President, Baptist Student Ministry, 1999-2000
Treasurer, Baptist Student Ministry, 1998-1999